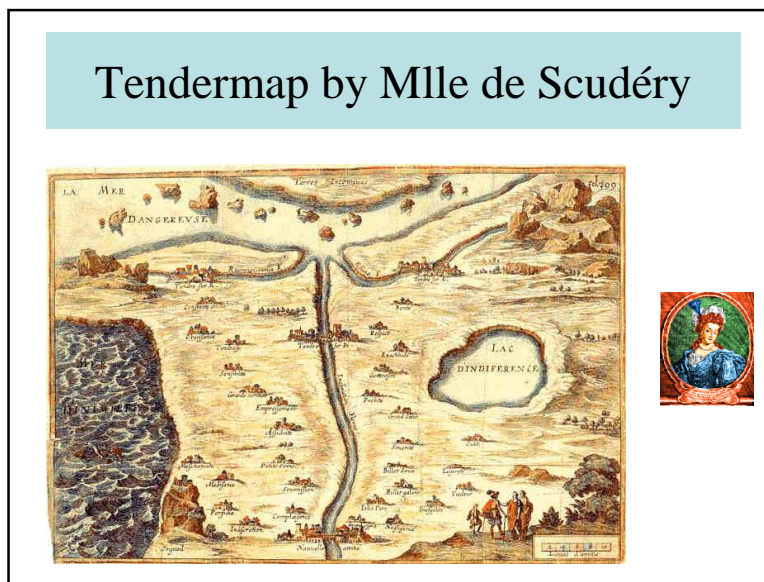
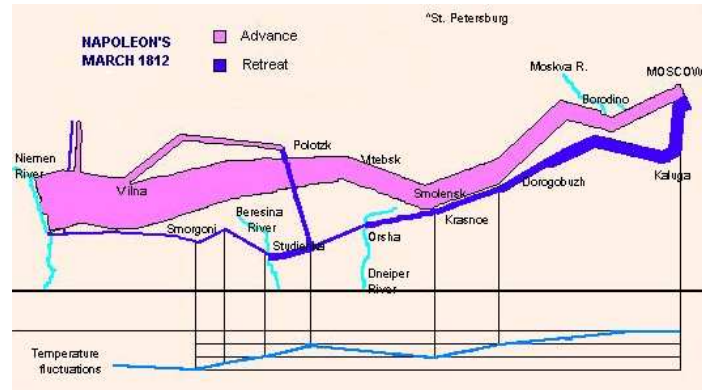


Chapter I
Introduction to
Graphic Semiology

- 1 – Introduction to
Graphic Semiology
- 1.1 – Introduction
 - 1.2 – Static Cartography
 - 1.3 – Dynamic and Interactive Cartography
 - 1.4 – Subjective Aspects of colors
 - 1.5 – Color Matching
 - 1.6 – Cartograms
 - 1.7 – Chorems
 - 1.8 – How to Lie with Maps
 - 1.9 – Conclusions



Minard drawing



1. 1 – Introduction

- Semiology: Study of meaning
- Graphic Semiology:
 - Meaning of drawings
 - Choice of captions, symbols and icons
 - Methodology to transmit a visual message
- Bertin Jacques, *Sémiologie graphique*, La Haye, Mouton, 1970.
- "A picture is worth 1000 words"



Methodology

- Analysis of the message to be transmitted
- Selection of the medium
- Selection of icons, symbols
- Structuring corporate design/identity
- Psycho-technical Tests

Applications

- Highway Code
- Commercial messages
- Newspaper layout
- Corporate identity
- Mapping
- Statistical summaries
- GUI design
- Etc.

Animated Graphic Semiology

- Movement
 - ex: linear phenomenon
- Flickering
- Mutation
- Replacement
- Gradual modification
 - ex: gradual modification of a shape
 - ex: slow modification of colors
- Velocity
 - Adapted to the size, to the contrast and duration of the phenomenon.

Information to be transmitted

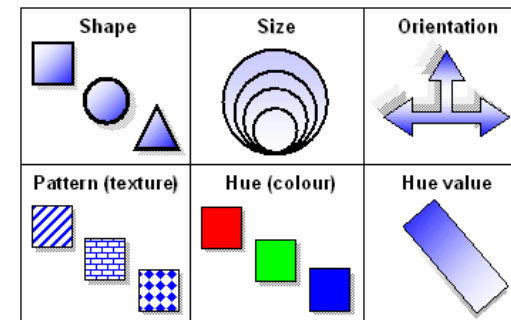
- **Differential information:** a list of objects, of production goods, of countries, etc.
- **Ranked information :** geological layers, chronological order, etc.
- **Quantitative information:** measures, proportions, etc.

Iconic symbols



Bertin

Visual Variables



Bertin's visual variables

Visual variable	INTERVAL / ratio			visual levels	
	nominal	ordinal	INTERVAL / ratio	visual isolation	visual levels
LOCATION					
size					
texture					
colour hue					
orientation					
shape					
colour value					
colour saturation					
resolution					
crispness					
transparency					
arrangement					

effectiveness: good (black), marginal (grey), poor (white)

Map legend

<http://www.nrcan.gc.ca/ess/pubs/guide/images/legend.gif>

Creating legend

<http://www.geocities.com/schools/elementary.html>

Size

- Size variation allows the representation of quantitative variations

Shapes

- Shapes represent object identities
 - Pictograms
 - Basic shapes (square, circle, etc.)
- Readability often better than realistic drawings

Hue values

- Variation of color value is a variation of luminous intensity; allows ordered relations (quantitative relations)

Colors

- May represent differences, but there are cultural and psychological connotations.
- → non-ordered differences

Patterns

- Patterns may represent several variables (shape, size) through ordered relations and relative quantitative differences

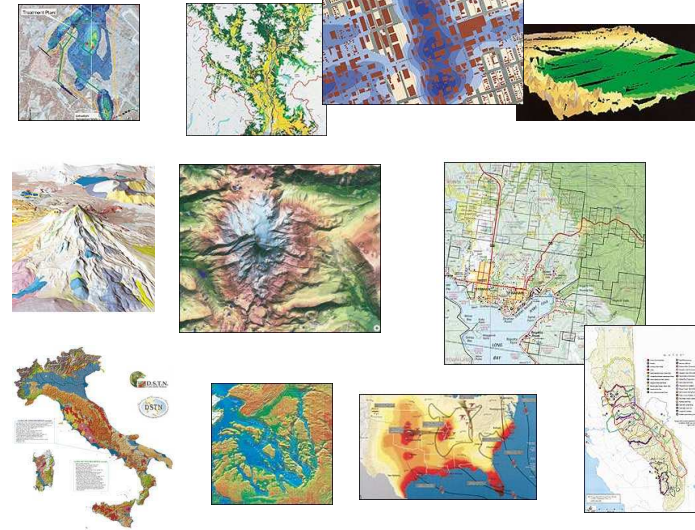
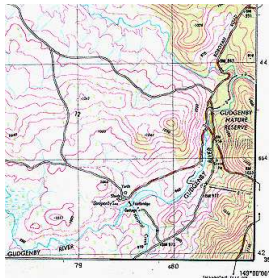
Orientation

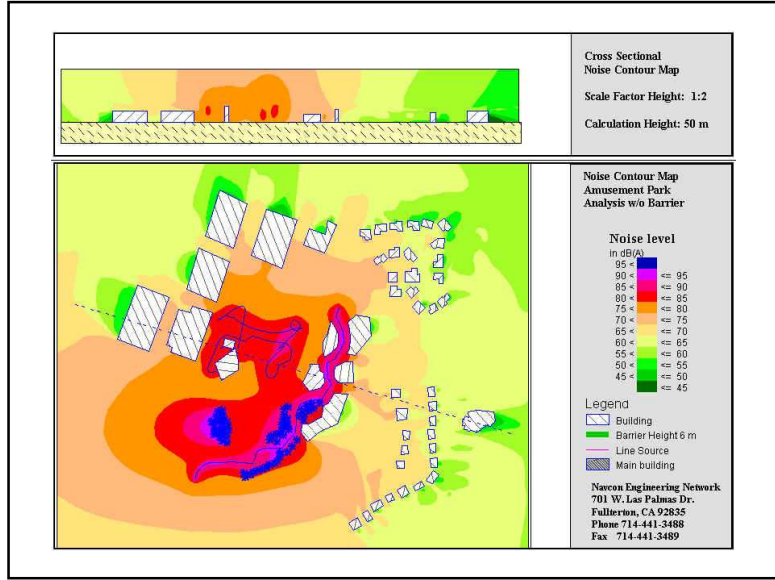
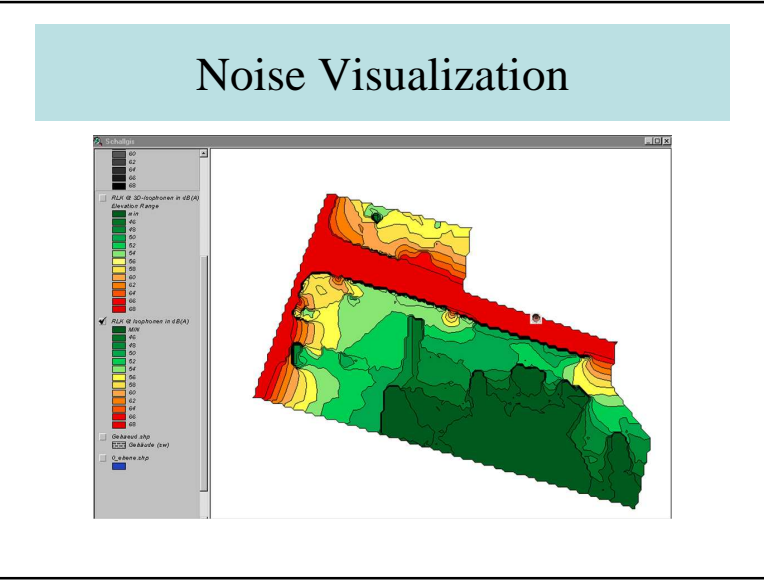
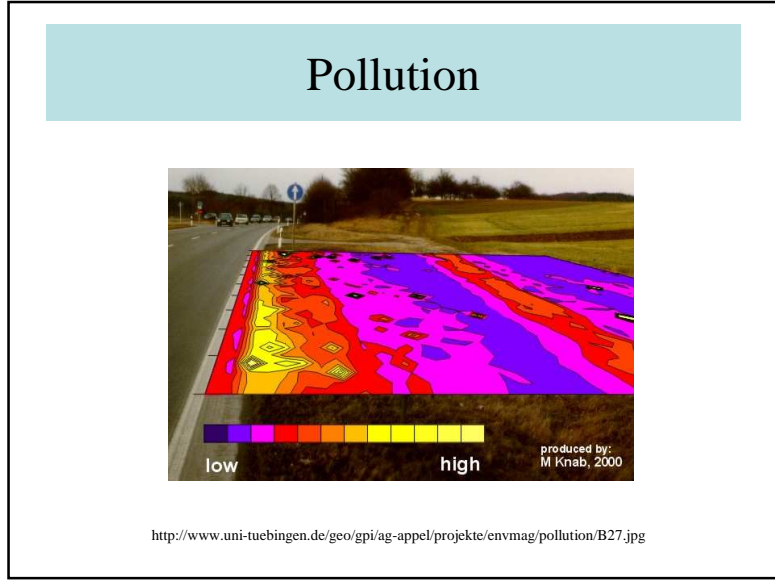
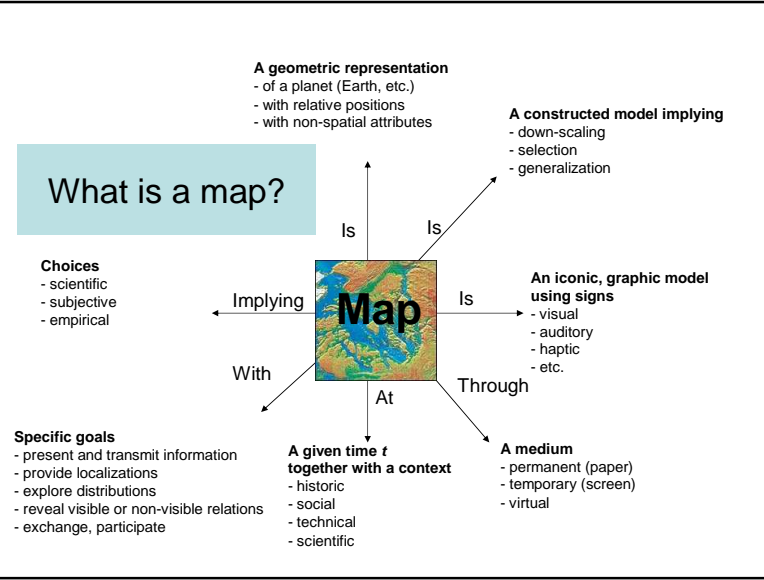
- Allows the positioning vis-à-vis axes

1.2 Static Cartography

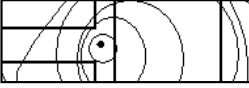
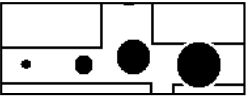
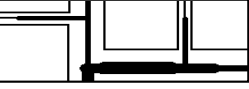
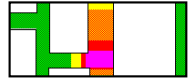


- Common Cartography
- Necessity of a scale
 - What about scale 1?
- Necessity of coding, captions, simplifications, etc.
- But what is exactly a map?

Examples



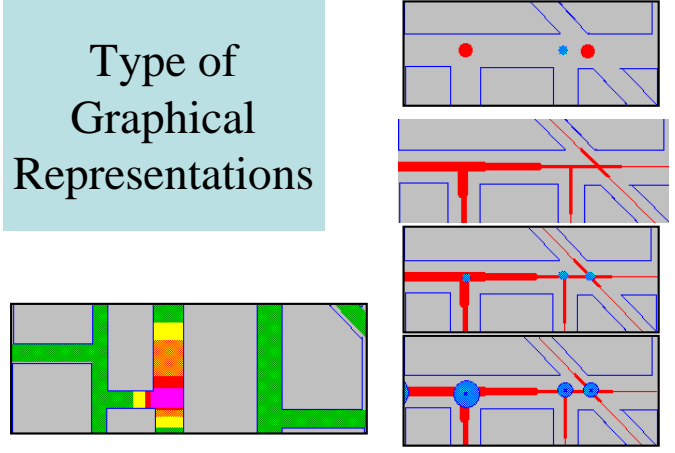


Graphical representation

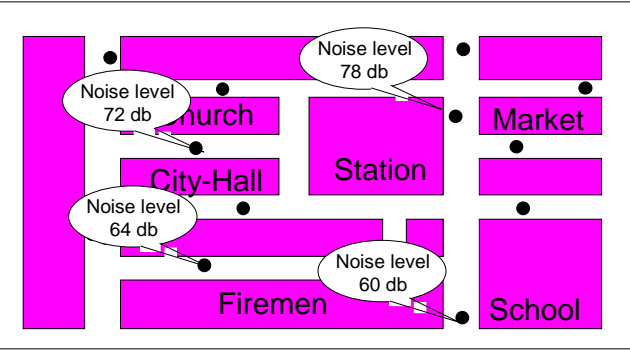
- Isophons 
- Proportional circles 
- Proportional lines 
- Colors and Textures 
- Symbols 
- Bubbli 

niv bruit fond: 50 dB
niv bruit pointe: 75 dB
Leq: 65 dB
Date mesure: 25/12/95

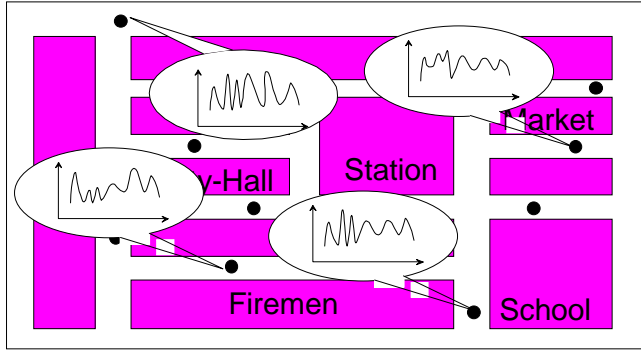
Type of Graphical Representations

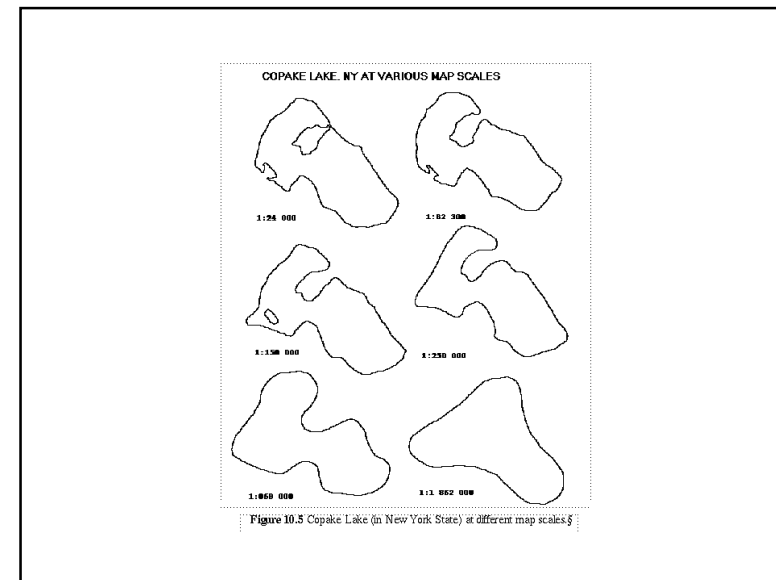
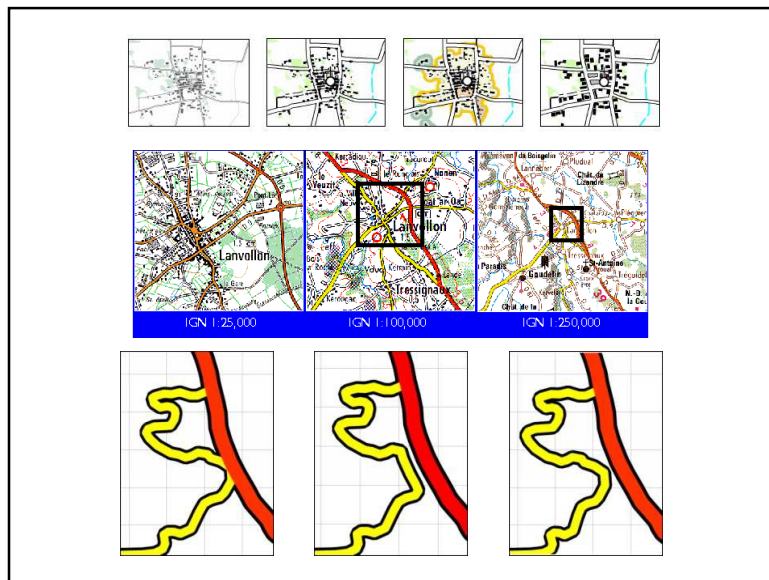
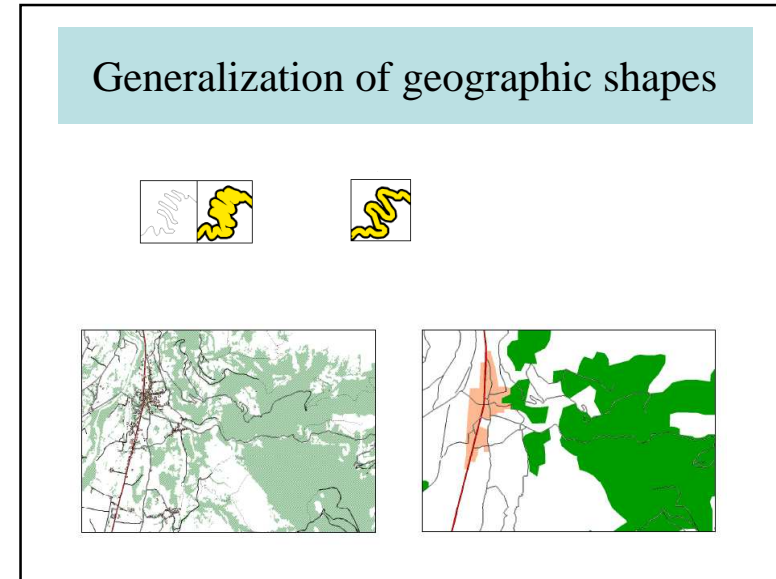
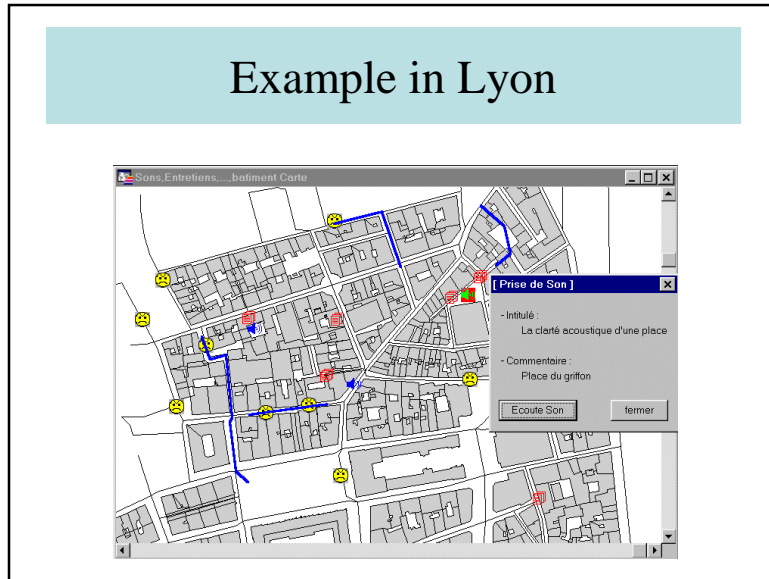


Balloons with measures

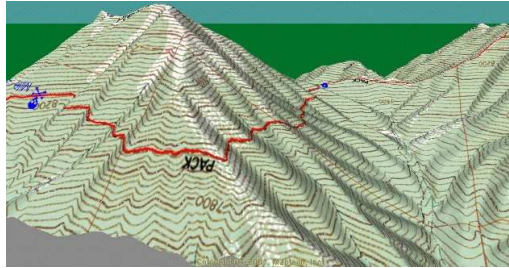


Ballons with acoustic signals



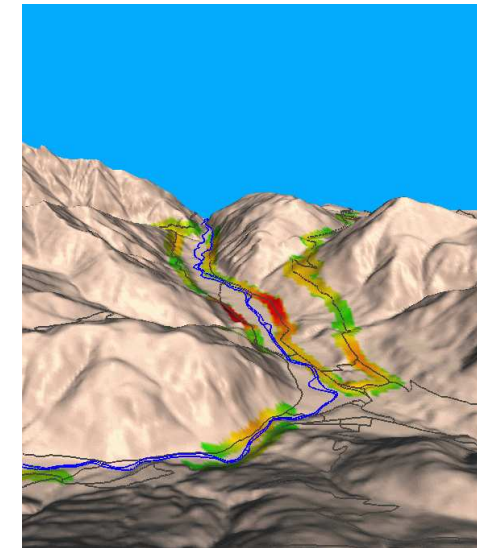


3D Mapping

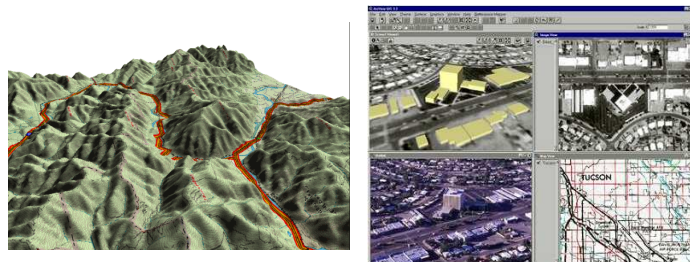


Risk 3D map

[mpa.itc.it/
corso.html](http://mpa.itc.it/corso.html)



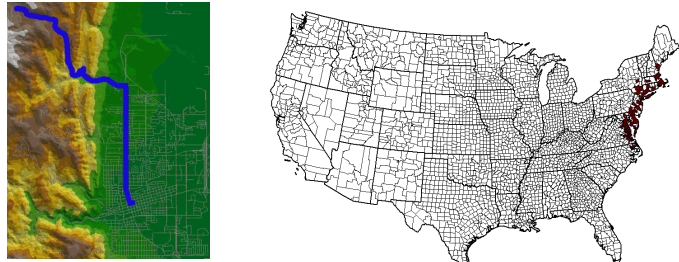
Other 3D examples



1.3 – Animated and Interactive Cartography

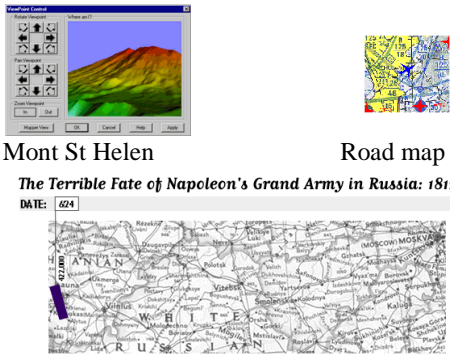
- With animation
 - modification of shapes
 - modification of colors
- What about extensions of graphic semiology?

Examples of animated maps



The first image shows a 3D topographic map of a landscape with a blue river winding through it. The second image shows a 2D network map of the United States with a red path highlighting a specific route across the country.

Other examples



The first image is a 3D topographic map of Mount St. Helens. The second image is a road map. The third image is a historical network map titled "The Terrible Fate of Napoleon's Grand Army in Russia: 1812" with a date of 1812. It shows a complex network of roads and cities, with a purple path indicating the march of the army.

Mont St Helens


Road map

The Terrible Fate of Napoleon's Grand Army in Russia: 1812
DATE: 1812

Adapted from the Statistical Graph of Charles Minard (1861).
by Aaron Walburg and Stephen Hartzog (1996)

<http://www.math.yorku.ca/SCS/Gallery/minard/march-animated.gif>

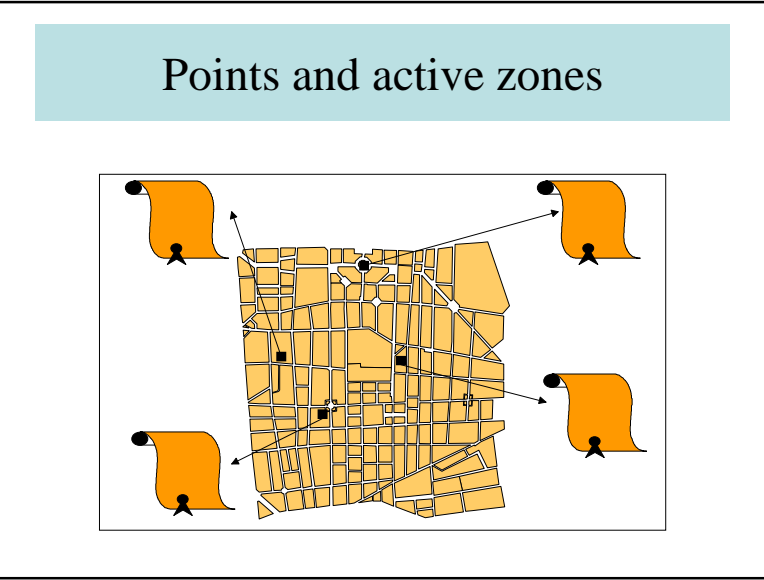
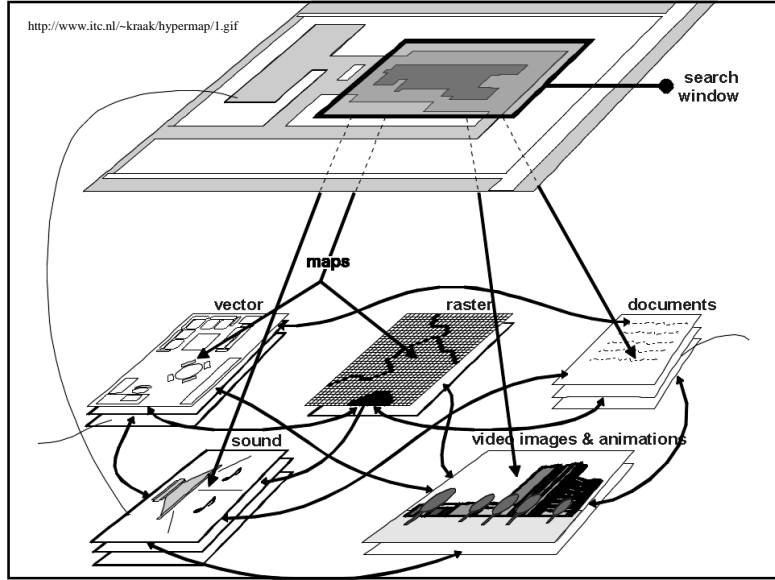
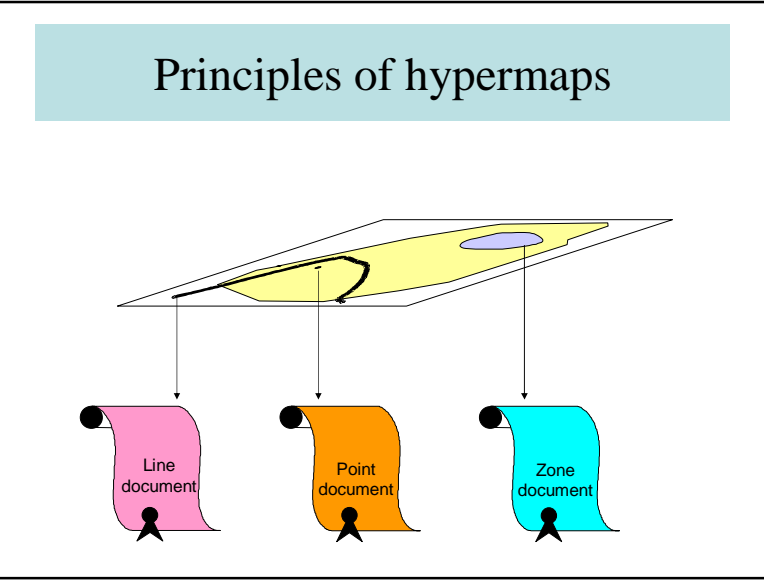
Noise of a moped



The image shows a grayscale aerial photograph of a city street grid. A color-coded noise map is overlaid on the image, with red and yellow indicating higher noise levels, primarily along the main roads and near a railway line.

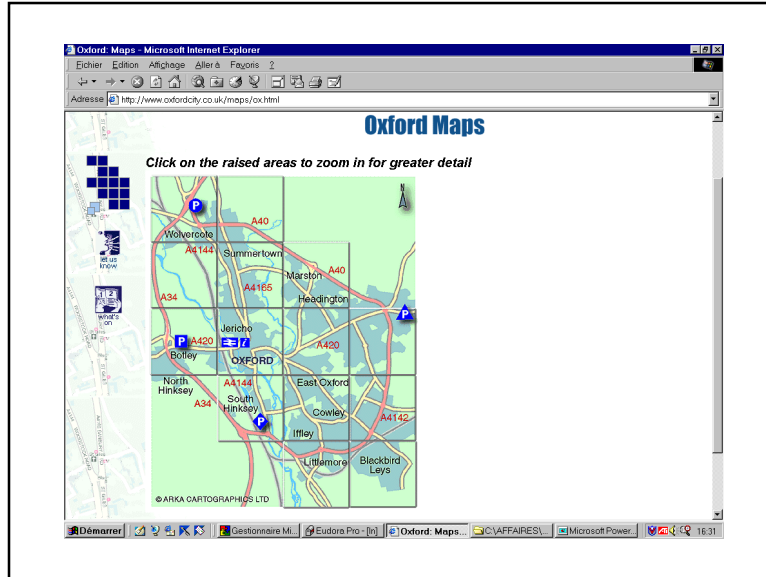
Active cartography

- User interaction
- Clickable maps
- Hypermaps



http://www.meteo.fr

The screenshot shows the METEO FRANCE website interface. At the top left is the 'METEO FRANCE' logo. Below it are navigation links: 'Contact', 'Plan du site', 'Liens', 'Infos', and 'Recherche'. A main menu on the left includes 'accueil', 'Les actus', 'Météo France', and 'Services en ligne'. The central area features a search section with 'Le temps pour tous > Monde >', a 'Région' dropdown, and a 'Villes' dropdown. To the right is a 'Légende' section with links for 'Voir', 'Image satellite', 'Image satellitaire prévue', 'Fiches Climatologiques', and 'Climat du monde'. The bottom section is titled 'Nos prévisions' and lists options 'par domaine' (France, Outre-Mer, Europe, Monde) and 'par activité' (Mer, Montagne, Voyage, Aéronautique). A world map is displayed at the bottom with numerous colored dots representing weather data points.



Hypermap for risks in Genoa
<http://www.provincia.genova.it/pdb/pdb03.htm>

By clicking on a zone, one can get information about future landslides and floods

Argumaps with smileys

Botone al menù principale

1.4 – Subjective Aspects of colors

- Analysis of some common colors
- “Colored people”

Red

- Meaning
 - power, sex, interdiction, danger,
 - blood, warmth
 - Santa Claus
 - Good luck (Asia)










Blue

- Meaning
 - tranquility
 - authority, competence
 - nobility, blue blood (France)
 - immortality (Chine)









Yellow

- Meaning
 - youth
 - coward
 - advertising signal
 - construction
 - telephone directories
 - sun, light










Green

- Meaning
 - hope, harmony
 - nature, jealousy
 - money (USA)
 - ecology
 - give authorization












White





- Meaning
 - purity, innocence, cleanness
 - kingdom
 - rendition
 - official announcement (France)


Black

- Meaning
 - death
 - ill omen
 - Anarchy
 - tuxedo

Brown

- Meaning
 - solidness
 - neutrality
 - “bullshit”



Rose

- Meaning
 - innocence, fragility
 - woman,





Violet



- Meaning
 - authority (color officialis)
 - suffering
 - melancholy



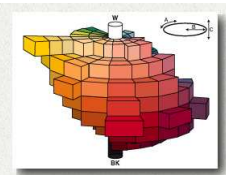
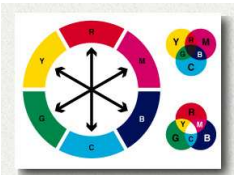




1.5 – Color Matching

- Johannes ITTEN's Theory



Linking colors

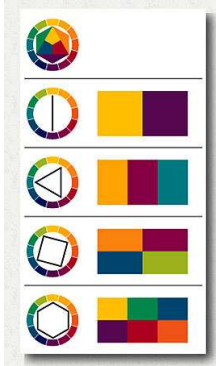


http://www2.epson.fr/technologies/colorguide/COL_G/MAINMENU.HTM

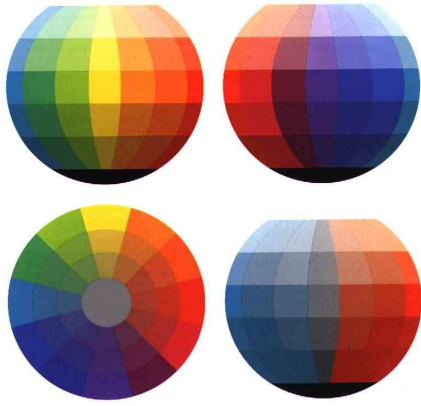
Stars and Circles





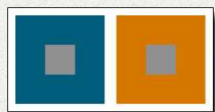
Harmony of colors




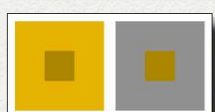
Examples of shading



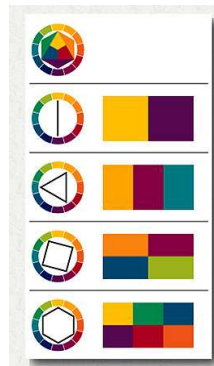
Hue Contrast 

Complementary color contrast 

Luminous Contrast 


Chroma Contrast 

Selection of colors




Seven Contrasts


The contrast of complements
The contrast is formed by the juxtaposition of color wheel or perceptual opposites.




The contrast of warm and cool
The contrast is formed by the juxtaposition of hues considered 'warm' or 'cool.'




The contrast of light and dark
The contrast is formed by the juxtaposition of light and dark values. This could be a monochromatic composition.




The contrast of extension
Also known as the Contrast of Proportion. The contrast is formed by assigning proportional field sizes in relation to the visual weight of a color.




The contrast of complements
The contrast is formed by the juxtaposition of color wheel or perceptual opposites.



Simultaneous contrast
The contrast is formed when the boundaries between colors perceptually vibrate. Some interesting illusions are accomplished with this contrast.

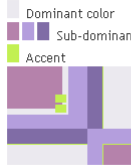


The contrast of hue
The contrast is formed by the juxtaposition of different hues. The greater the distance between hues on a color wheel, the greater the contrast.

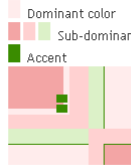


Proportion and Intensity

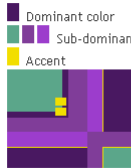
Dominant color
Sub-dominant colors
Accent



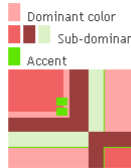
Dominant color
Sub-dominant colors
Accent



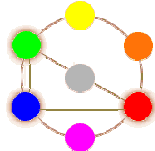
Dominant color
Sub-dominant colors
Accent



Dominant color
Sub-dominant colors
Accent

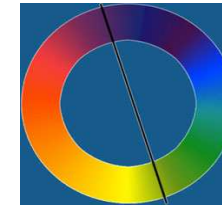


Bank notes in Euros



Cold and warm colors

Warm colors



Cold colors

Warm and cold colors



Examples of websites

<http://www.worqx.com/color/learning2.htm>



Web Site: www.gravis.com
Split-complementary relationship



primary field of analogous violet hues, contrasting accents of green & orange

Iten's contrast of hue
medium value / moderate contrast*

*Note that the use of the neutral field of gray dilutes the overall contrast of the page, whereas in the following example, the use of full values increases the contrast of the visual plane.



Web Site: www.treelogic.com
Complementary relationship



primary field of cyan, contrasting accent of red orange

Iten's contrast of hue or contrast of complements medium value/
high contrast

Web Site: www.ingenta.com
Split-complementary relationship

primary field of yellow, subordinate color of blue-green, accent of orange
Itten's contrast of hue or contrast of complements light-medium value/ moderate contrast

Web Site: www.neumedia.com
Split-complementary relationship

primary field of purple, contrasting accents of red orange and cyan
Itten's contrast of hue or contrast of complements medium value/ moderate-high contrast

Web Site: www.smithandhawken.com
Analogous relationship

primary field of desaturated yellow, contrasting accents of desaturated orange and green
Itten's contrast of hue medium value/ moderate contrast

Web Site: www.compendiumdesian.com (html version)
Triad relationship

primary field of orange, subordinate contrast of blue-violet, and contrasting accent of green
Itten's contrast of hue medium value/ moderate contrast

Amelioration of maps

Aléa torrentiel:
fort
moyen
faible

Enjeu:
maison

Hydrographie:
cours d'eau

Aléa torrentiel:
fort
moyen
faible

Enjeu:
maison

Hydrographie:
cours d'eau

1.6 – Cartograms

- Maps not made according to areas, but distorted according to some parameters
- Distortion
 - Approximately same shape
 - Rectangles
 - Circles (Dorling)

World Population

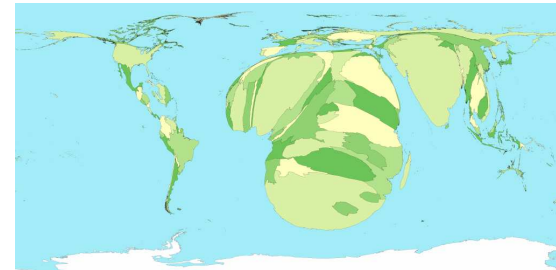
CARTOGRAM OF THE WORLD'S NATIONAL POPULATIONS, 2002

1 Guatemala	16 Paraguay	31 Slovakia	46 Yemen	61 Liberia	76 Namibia
2 El Salvador	17 Uruguay	32 Slovenia	47 Saudi Arabia	62 Ivory Coast	77 Botswana
3 Honduras	18 Chile	33 Croatia	48 Oman	63 Benin	78 Nicaragua
4 Nicaragua	19 Cambodia	34 Bosnia	49 Libya	64 Fiji	79 Luxembourg
5 Costa Rica	20 Barbados	35 Yugoslavia	50 Niger	65 Serbia	80 Kazakhstan
6 Panama	21 Indonesia	36 Hungary	51 Central African Republic	66 Gabon	81 Cameroon
7 Jamaica	22 Bahamas	37 Macedonia	52 Tunisia	67 Cameroon	82 Madagascar
8 Iraq	23 Maldives	38 Albania	53 Senegal	68 Congo	83 Mauritius
9 Dominican Republic	24 Norway	39 Bulgaria	54 Mali	69 Congo	84 Djibouti
10 Puerto Rico	25 Sweden	40 Greece	55 Mauritania	70 Canada	85 China
11 Trinidad and Tobago	26 Finland	41 Cyprus	56 Haiti	71 Taiwan	86 Mongolia
12 Cyprus	27 Austria	42 Lebanon	57 Cambodia	72 Serbia	87 Afghanistan
13 Denmark	28 Switzerland	43 Israel	58 Cuba	73 Zimbabwe	88 Bhutan
14 Ecuador	29 Portugal	44 Jordan	59 Comoros	74 Nepal	89 Maldives
15 Bolivia	30 Czech Rep.	45 United Arab Emirates	60 Sierra Leone	75 Angola	90 Laos
					91 Cambodia
					92 Kazakhstan
					93 Tajikistan
					94 Brazil
					95 New Zealand
					96 New Zealand
					97 Russia
					98 Estonia
					99 Latvia
					100 Lithuania
					101 Moldova
					102 Georgia
					103 Armenia
					104 Azerbaijan

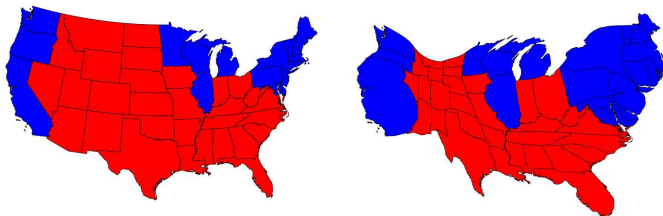
World Population



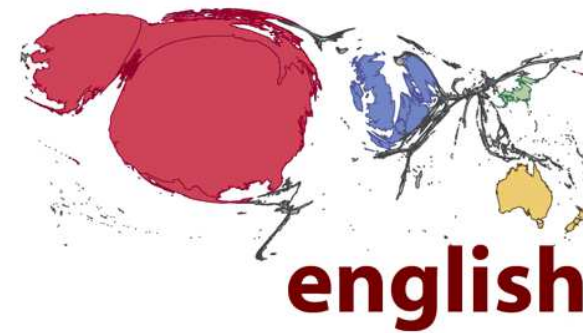
People living with AIDS

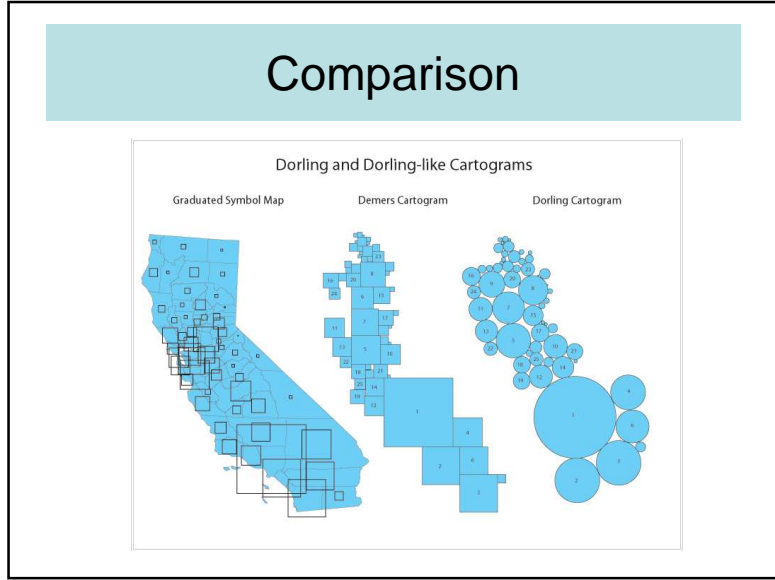
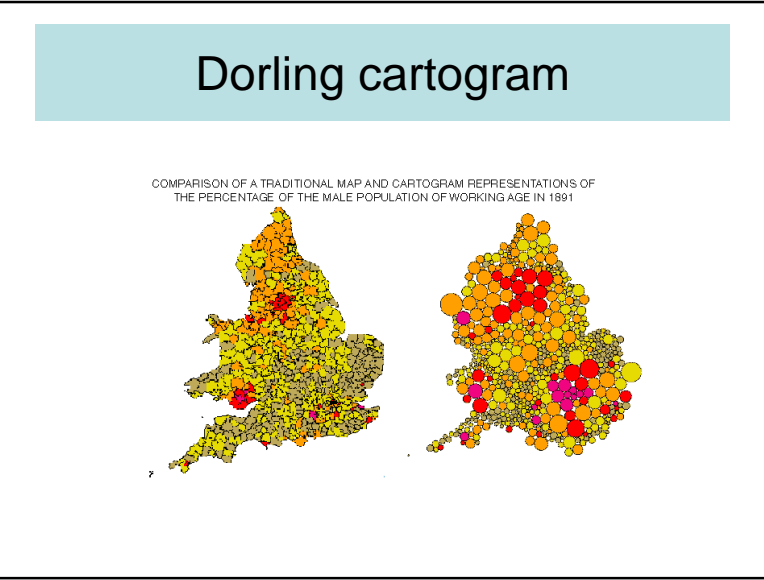


US presidential election 2004



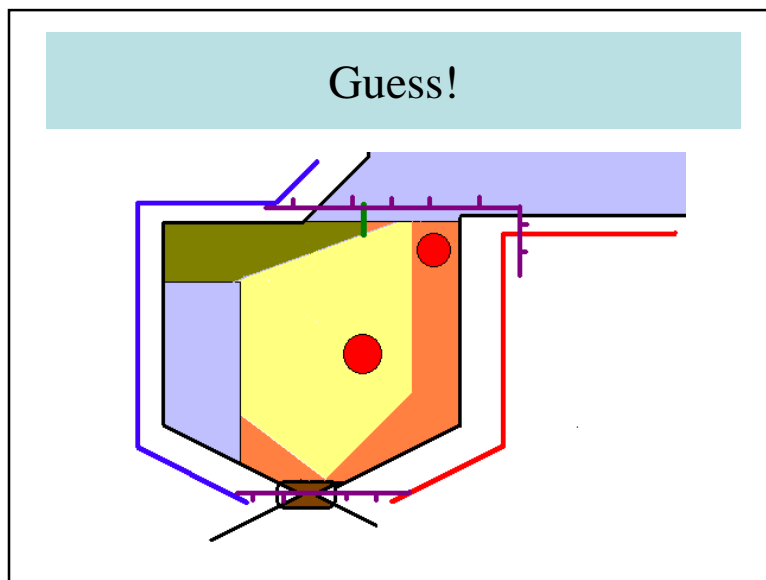
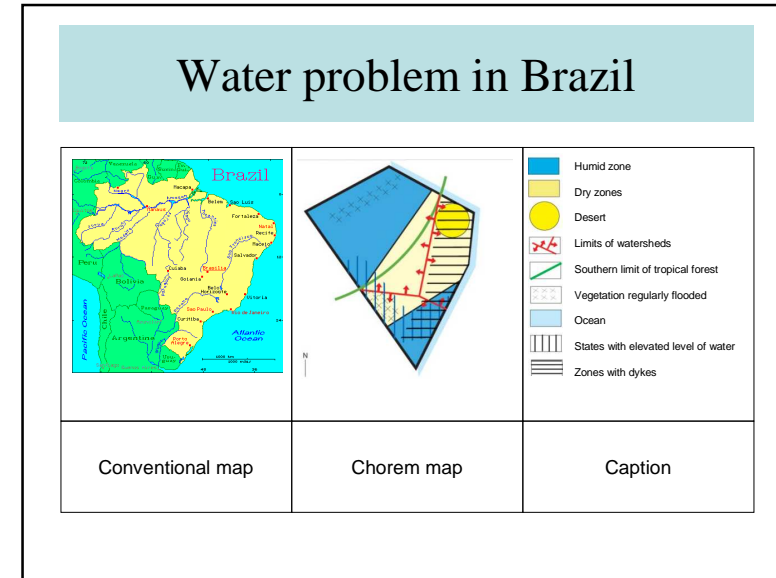
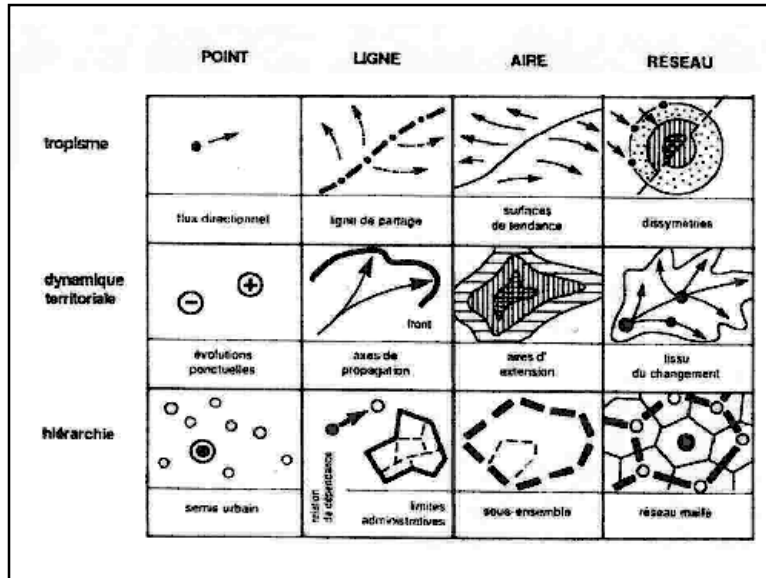
English-speaking





- ### 1.7 – Chorems
- A chorem is a schematic representation transmitting meaning for a spatial phenomenon
 - Generally visual representation
 - Brunet’s Chorems

	POINT	LIGNE	AIRE	RESEAU
maillage				
	chef-lieu	limite administrative	Etat, région...	centres, centres et polygones
quadrillage				
	tête de réseau carrefour	voies de communication	aire de desserte irrigation, drainage	réseau
attraction				
	points attirés satellites	lignes d'isotropie orbites	aire d'attraction	liaisons préférentielles
contact				
	point de passage	rupture, interface	aires en contact	base site de point



- ### 1.7 – How to Lie with Maps !
- Ill-chosen legend can yield erroneous decision-makers
 - Voluntarily or non voluntarily
 - Book "*How to Lie with Maps!*"

How To Lie With Maps

Example

FIGURE 1.1. Representation of Logashkino and vicinity, on the East Siberian Sea, on various Soviet maps published between 1939 and 1969.

Funny busline

MAP OF THE Helter, Skelter & Northern Railway

Route of the Flying Squirrel

MAP OF THE Helter, Skelter & Northern Railway

Route of the Flying Squirrel

Ill-chosen captions

Thousands of Inhabitants

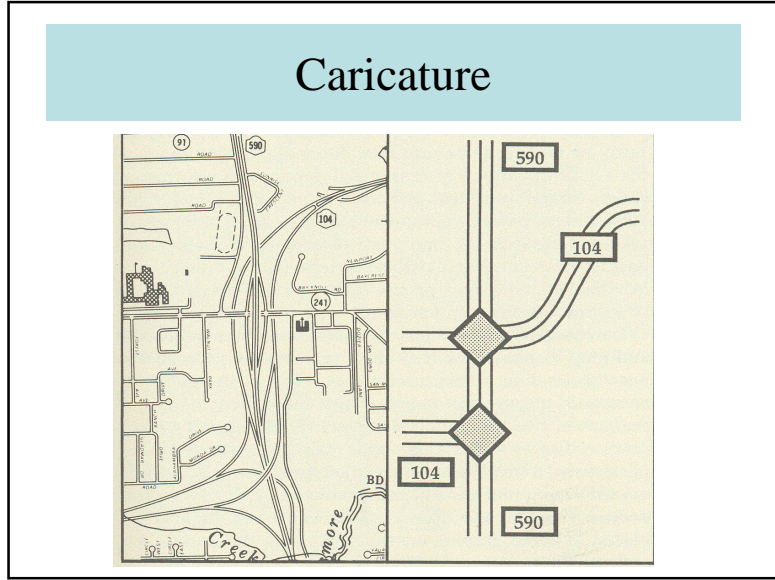
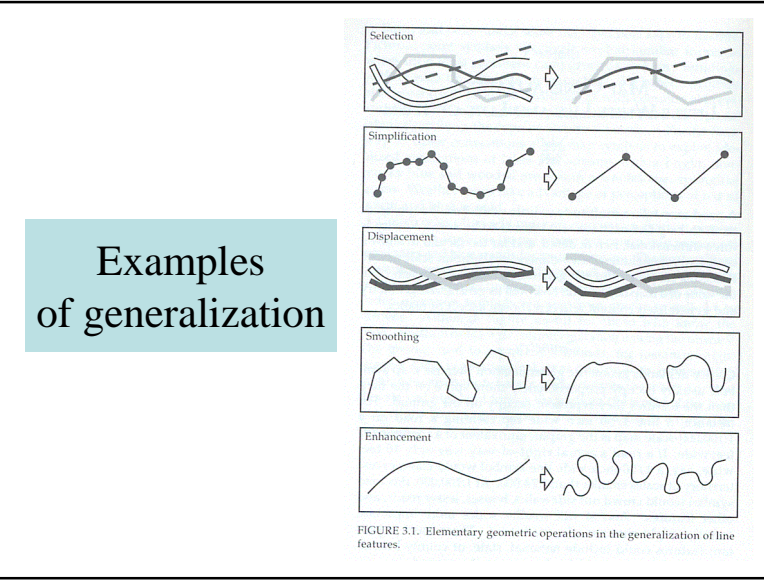
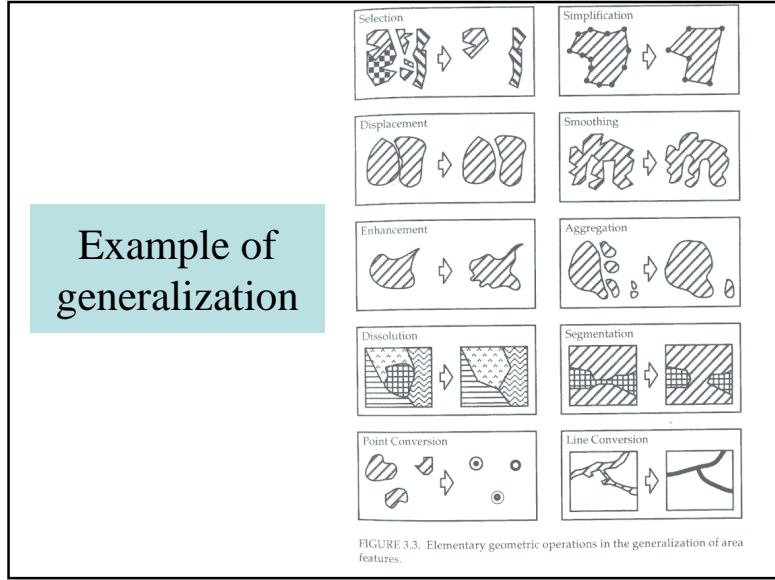
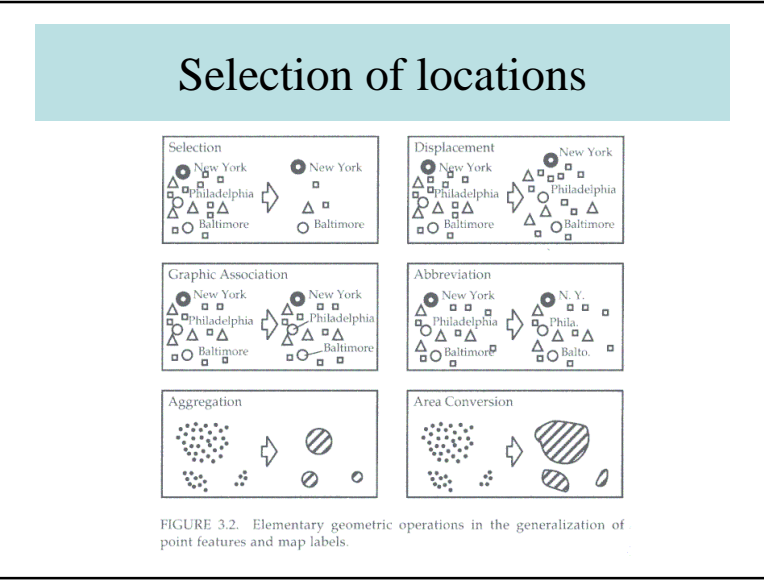
Thousands of Inhabitants

Thousands of Inhabitants

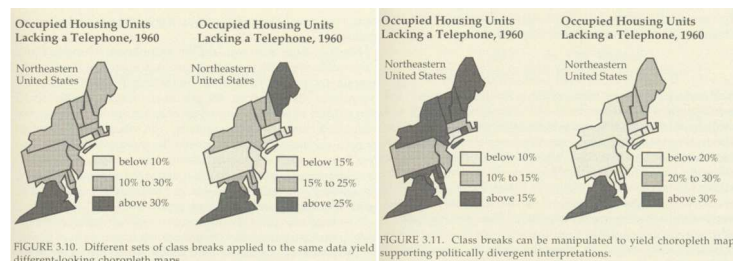
Persons per Square Kilometer

Thousands of Inhabitants

Persons per Square Kilometer

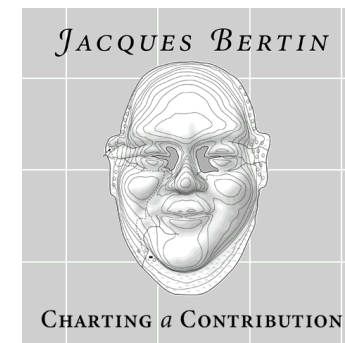


Bad segmentation



1.9 – Conclusions (1/2)

- Importance of semiology
 - static
 - dynamic
 - interactive
- Importance of the message to be transmitted
- How to Lie?



Conclusion (2/2)

- Vision and shape understanding
- Vision and color understanding
- Cultural aspects
- Cognitive aspects

