Evolution or Devolution of Cartographic Education?

Transformations in Teaching Cartographic Concepts and Techniques

Aileen Buckley

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Terminology

de·volve [di-**volv**] Pronunciation Key – Show IPA Pronunciation *verb,* –**volved,** –**volv·ing.**

–verb (used with object)
1. to transfer or delegate (a duty, responsibility, etc.) to or upon another; pass on.
2. *Obsolete.* to cause to roll downward.

–verb (used without object)
3. to be transferred or passed on from one to another: *The responsibility devolved on me.*
4. *Archaic.* to roll or flow downward.

[Origin: 1375–1425; late ME *devolven* < L *dévolvere* to roll down, equiv. to *dé–* DE– + *volvere* to roll]

—Related forms
de·volve·ment, *noun*

Dictionary.com Unabridged (v 1.1)
Based on the Random House Unabridged Dictionary, © Random House, Inc. 2006.

UCGIS* Body of Knowledge

CV Cartography and visualization

This Knowledge Area addresses the complex issues involved in effective visual thinking and communication of geospatial data and of the results of geospatial analysis. This Knowledge Area reflects much of the domain of cartography and visualization, although some components can be found in others.

* University Consortium for Geographic Information Science

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CV1 History and trends
- ☐ CV1-1 History of cartography
- ☐ CV1-2 Technological transformations

CV2 Data considerations
- ☐ CV2-1 Source materials for mapping
- ☐ CV2-1 Data abstraction: classification, selection and generalization
- ☐ CV2-3 Projections as a map design issue

CV3 Principals of map design
- ☐ CV3-1 Map design fundamentals
- ☐ CV3-2 Basic concepts of symbolization
- ☐ CV3-3 Color
- ☐ CV3-3 Typography

CV4 Graphic representation techniques
- ☐ CV4-1 Basic thematic mapping methods
- ☐ CV4-2 Multivariate maps
- ☐ CV4-3 Dynamic and interactive mapping
- ☐ CV4-4 Representing terrain
- ☐ CV4-5 Web mapping and visualizations
- ☐ CV4-6 Virtual and immersive environments
- ☐ CV4-7 Spatialization
- ☐ CV4-8 Visualization of temporal geographic data
- ☐ CV4-9 Visualization of uncertainty

CV5 Map production
- ☐ CV5-1 Computational issues in cartography and visualization
- ☐ CV 5-2 Map production
- ☐ CV 5-2 Map reproduction

CV6 Map use and evaluation
- ☐ CV6-1 The power of maps
- ☐ CV6-2 Map reading
- ☐ CV6-3 Map interpretation
- ☐ CV6-4 Map analysis
- ☐ CV6-5 Evaluation and testing
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Making maps

Making special types of map

Using maps

Evolution of cartography education

- ☐ Does it reflect this current content?
- ☐ What was the earlier content?
- ☐ How can we examine the evolution?
- ☐ My approach...

Course Evolution

- Waldo Tobler – Professor Emeritus of Geography at University of California, Santa Barbara
  - BA – 1956, U British Columbia & U Washington, Seattle
  - MA – 1958, U Washington, Seattle, Cartography
  - PhD – 1961, U Washington, Seattle
- Phillip Muehrcke – Professor Emeritus of Geography at University of Wisconsin, Madison
  - BA – 1964, Northern Michigan University, Geography
  - MA - 1966, University of Michigan, Geography
  - PhD - 1969, University of Michigan, Geography
- Jon Kimerling – Professor of Geography at Oregon State University, Corvallis
  - BA – 1972, University of Washington, Geography
  - MA – 1973, University of Wisconsin, Geography & Cartography
  - PhD – 1976, University of Wisconsin, Geography & Cartography
- Aileen Buckley – former Assistant Professor at University of Oregon in Eugene; adjunct Associate Professor at University of Redlands
  - BA – 1982, Valparaiso University, Geography
  - MA – 1992, Indiana University & Michigan State University, Geography & Cartography/GIS
  - PhD – 1997, Oregon State University, Geography & Geographic Techniques (GIS/Cart/RS)
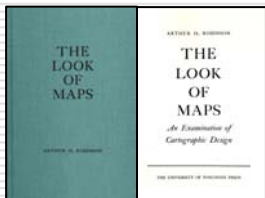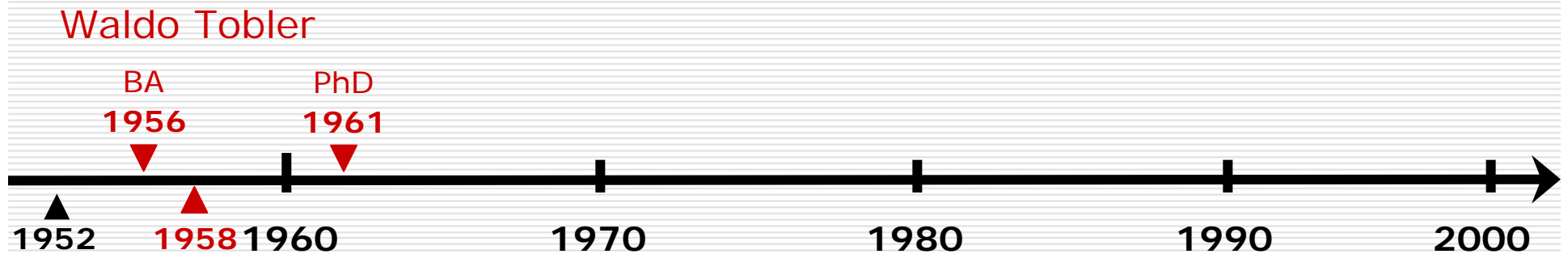
Cartography classes over the years

1960 1970 1980 1990 2000

Cartography classes over the years

1952   1960   1970   1980   1990   2000

Arthur Robinson

The Look of Maps

Cartography classes over the years

Waldo Tobler

BA
1956

PhD
1961

1952   1958 1960   1970   1980   1990   2000

MA

Arthur Robinson

The Look of Maps

Cartography classes over the years

Waldo Tobler   Phil Muehrcke

BA   PhD   MA
1956   1961   1966

1952 1958 1960 1964 1969 1970   1980   1990   2000

      MA   BA   PhD

Arthur Robinson

The Look of Maps

Cartography classes over the years

Waldo Tobler   Phil Muehrcke   Jon Kimerling

BA	PhD	MA	BA	PhD
1956	1961	1966	1972	1976

1952   1958 1960 1964   1969 1970 1973   1980   1990   2000

MA   BA   PhD   MA

Arthur Robinson

The Look of Maps

Cartography classes over the years

Waldo Tobler   Phil Muehrcke   Jon Kimerling   Aileen Buckley

BA   PhD   MA   BA   PhD   BA   MA
1956   1961   1966   1972   1976   1982   1992

1952   1958 1960 1964   1969   1970 1973   1980   1990 1997 2000
       MA   BA   PhD   MA   PhD
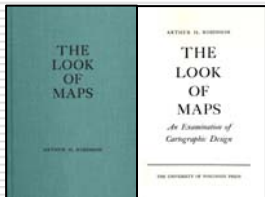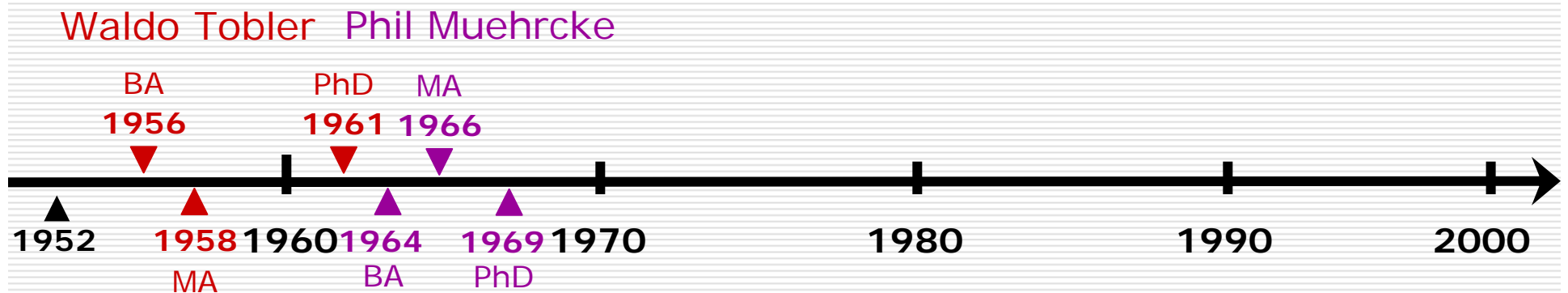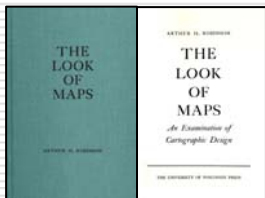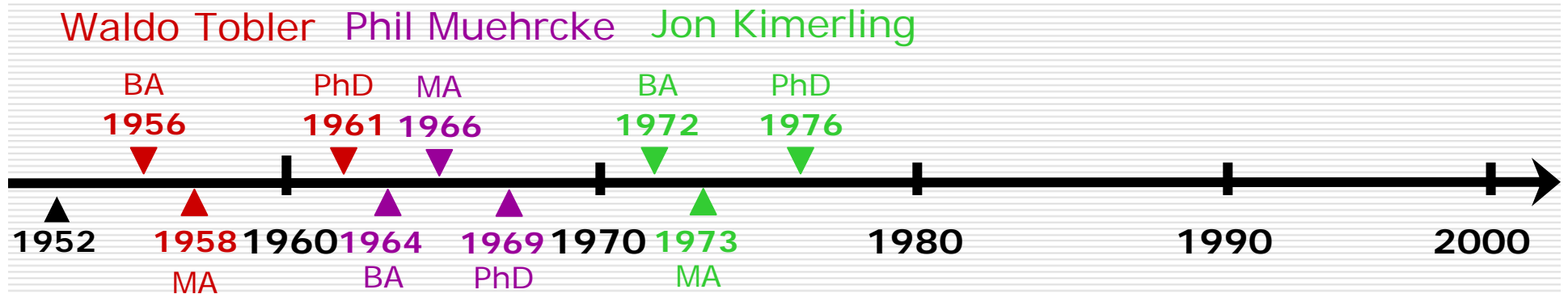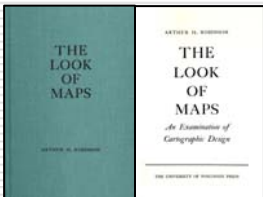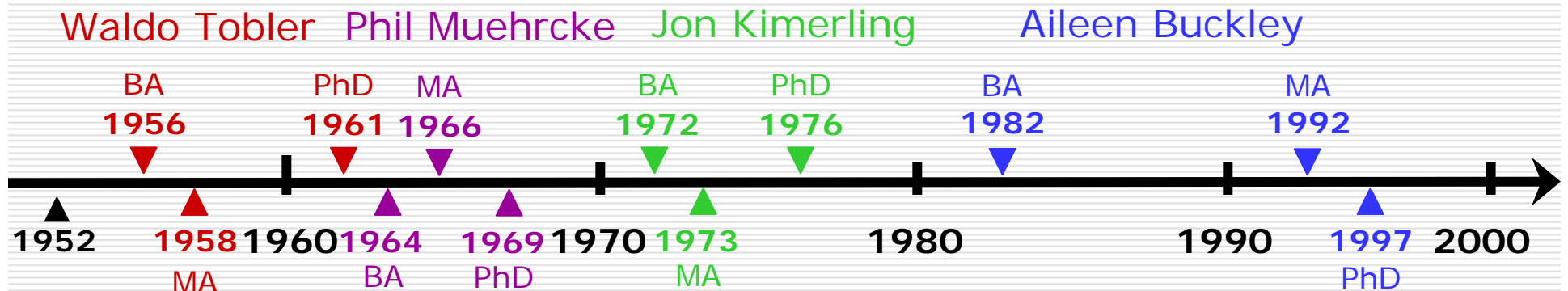
Arthur Robinson

The Look of Maps
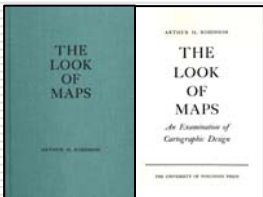
Waldo's cartography classes

1956 ☐ Undergraduate degree (U WA)
- One year of cartography (Ross MacKay – UBC)
- Cartography class (John Sherman – U WA)

1958 ☐ Master's degree (U WA)
- 2-3 cartography classes (John Sherman)
- Map Reproduction (Bill Heath)
- Cartography (TA)
- Department Cartographer

1961 ☐ Doctoral degree (U WA)
- Seminars

Phil's cartography classes

1964 ☐ Undergraduate degree (NMU)
- ■ Basic Cartography (Pat Farrell)

1966 ☐ Master's degree (U MI)
- ■ Introduction to Photo Processing and Dark Room Methods (Waldo Tobler)
- ■ Photo Interpretation (can't remember)
- ■ introduction to Map Projections (Waldo Tobler)

1969 ☐ Doctoral degree (U MI/U Sydney)
- ■ Seminars

Jon's cartography classes

1972 ☐ Undergraduate degree (U WA)
- Map Interpretation
- Cartography
- Map Intelligence
- Map Production
- Computer Cartography (through Urban Studies)
- Map Projections (through Civil Engineering)

1973 ☐ Master's degree (U WI)
- History of Cartography
- Map Design
- Seminars

1976 ☐ Doctoral degree (U WI)
- Seminars
- Remote sensing classes

Aileen's cartography classes

1982 ☐ Undergraduate degree (Valpo U)
- ■ Introduction to Cartography

1992 ☐ Master's degree (IU/MSU)
- ■ Introduction to Cartography (TA)
- ■ Advanced Cartography
- ■ Map Production
- ■ Computer Cartography
- ■ Seminars
- ■ GIS classes

1997 ☐ Doctoral degree (OSU)
- ■ Introduction to Cartography (TA)
- ■ Air Photo and Image Interpretation
- ■ Seminars
- ■ GIS/remote sensing classes

Current cartography classes

- U WA
  - Maps and GIS
  - Principles of Cartography
  - Map Sources and Errors
  - Analytical Cartography

Current cartography classes

- U WI
  - Map Reading and Interpretation
  - Introduction to Cartography
  - Problems in Cartography
  - Graphic Design in Cartography
  - Cartographic Methods in Research
  - Introduction to Computer Cartography
  - Map Transformations and Coordinate Systems
  - Animated and Web-based Mapping

Current cartography classes

- OSU
  - Map and Image Interpretation
  - Cartography
  - Computer-assisted Cartography
  - Multimedia Cartography

Evolution of cartography education

☐ New content

Evolution of cartography education

☐ New content

☐ New ways
to teach
cartographic
concepts and
techniques

Evolution of cartography education

☐ New content

Web sites – tools for map makers

FAQs – users asking questions; experts providing answers

Blog – "Web log"; blog owners posting content

Forum – user community exchange

☐ New ways to teach cartographic concepts and techniques

Webcast – live, one hour, digitally recorded

Instructor-led course – presented by an instructor, face to face, 2-5 days

Virtual classroom – live, conference call, 3 days, ½ day classes

Online Web course – Web delivery of standard course content, "on your own"

Podcast – 10 minutes, focused, audio

Evolution of cartography education

☐ New content

☐ New ways to teach cartographic concepts and techniques

☐ Examples

Web sites – tools for map makers

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ESRI.com | Support | EDN | Training | More ESRI Sites...

ESRI Mapping Center

Welcome!
Login

Home | Blog | Ask A Cartographer | Maps | ArcGIS Resources | Other Resources

Welcome to Mapping Center

Mapping Center is about *the use of ArcGIS in the graphic delivery of geographic information*. Its goal is to help you make great looking maps by using the same cartographic concepts and techniques that professional cartographers use.

Current News Feeds

Set legend colors to match feature layer transparency
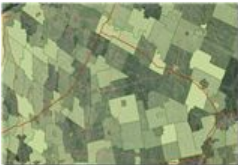
This question comes in fairly regularly at Ask A Cartographer future queries. This issue is a common one, and is th

Mapping Center Representations Survey

We would like your input on how you know a bit more about whether and Mapping Center. Given your input we the best level for the largest portion of our audience. The survey is only twelve...

Guidelines for minimum size for text and symbols on maps

Size

Viewing Distance
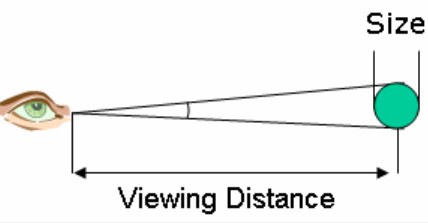
In relation to size in particular, the ability of an object to been seen from a distance relates to what is called the visual angle – or "a size that subtends one minute of angle (1/60th of a degree) at the eye". This is the ang...

How to apply saved Representation Rules in other layers

A question was posed on Ask a Cartographer about using representation rules that you have saved in a style in another map on a different layer. The online help for this topic didn't provide much assis...
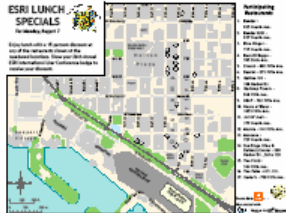
Mapping Center Web Site

- About Mapping Center
- About the Mapping Center

Mapping Center Blog

Announcements

Check out the presentations we made at the North American Cartographic Information Society (NACIS) conference this year. They are now on the Mapping Center Other Resources page.

Featured Map

ESRI LUNCH SPECIALS

ESRI Lunch Specials

The ESRI Lunch Specials Map was created to help attendees at the 26th Annual ESRI International Users Conference find a place to eat lunch and get a special discount.

FAQs – users asking questions; experts providing answers

Blog – "Web log"; blog owners posting content

ESRI Mapping Center

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Login

| Home | Blog | Ask A Cartographer | Maps | ArcGIS Resources | Other Resources |

Other Resources

Find out about ESRI presentations and publications, links to additional mapping resources on the ESRI Web site, and a special collection of Cartographers' Favorites. Note that you can sort by any of the headings.

| Presentations | Publications | Other ESRI Resources | Cartographers' Favorites |

Mapping-related resources available through other ESRI websites.

ESRI Forums

- ESRI Cartography Industry Discussion Conference
- ESRI Maplex Product Discussion Conference
- ESRI Data Models Discussion Conference

ESRI Industries

- GIS for Map, Chart, and Data Production

ESRI Support Site

- Knowledge Base
- Data Models
- Basemap Data Model
- Geoprocessing
- ESRI Developer Network (EDN)

ESRI Training & Education

- Free training seminars
  - An Introduction to Cartographic Representations at ArcGIS 9.2
  - Making Better Map Layouts with ArcGIS
- Instructor-led courses
  - Cartography with ArcGIS
  - Managing Cartographic Data in the Geodatabase
- Virtual classroom
  - Advanced Techniques for Labels and Annotation
- Web courses
  - Cartographic Design Using ArcGIS 9
  - Creating and Editing Labels and Annotation
  - The 15-Minute Map: Creating a Basic Map in ArcMap
  - Introduction to Map Production System-Atlas
- Podcast
  - Best Practices: Working with Cartographic Representations

FAQs – users asking questions; experts providing answers

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Forum – user community exchange

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Instructor-led course – presented by an instructor, face to face, 2-5 days

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DEVOLUTION of cartography education

- ☐ New content

  ⬇

- ☐ New ways
  to teach
  cartographic
  concepts and
  techniques

  ⬇

- ☐ New teachers/
  new audience

Web sites

- Tools for map makers
  - ColorBrewer.org
  - MapShaper.org
  - TypeBrewer.org
- Forum
  - CartoTalk.com
- Hybrid ?
  - MappingCenter.esri.com

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  - ■ CartoTalk.com
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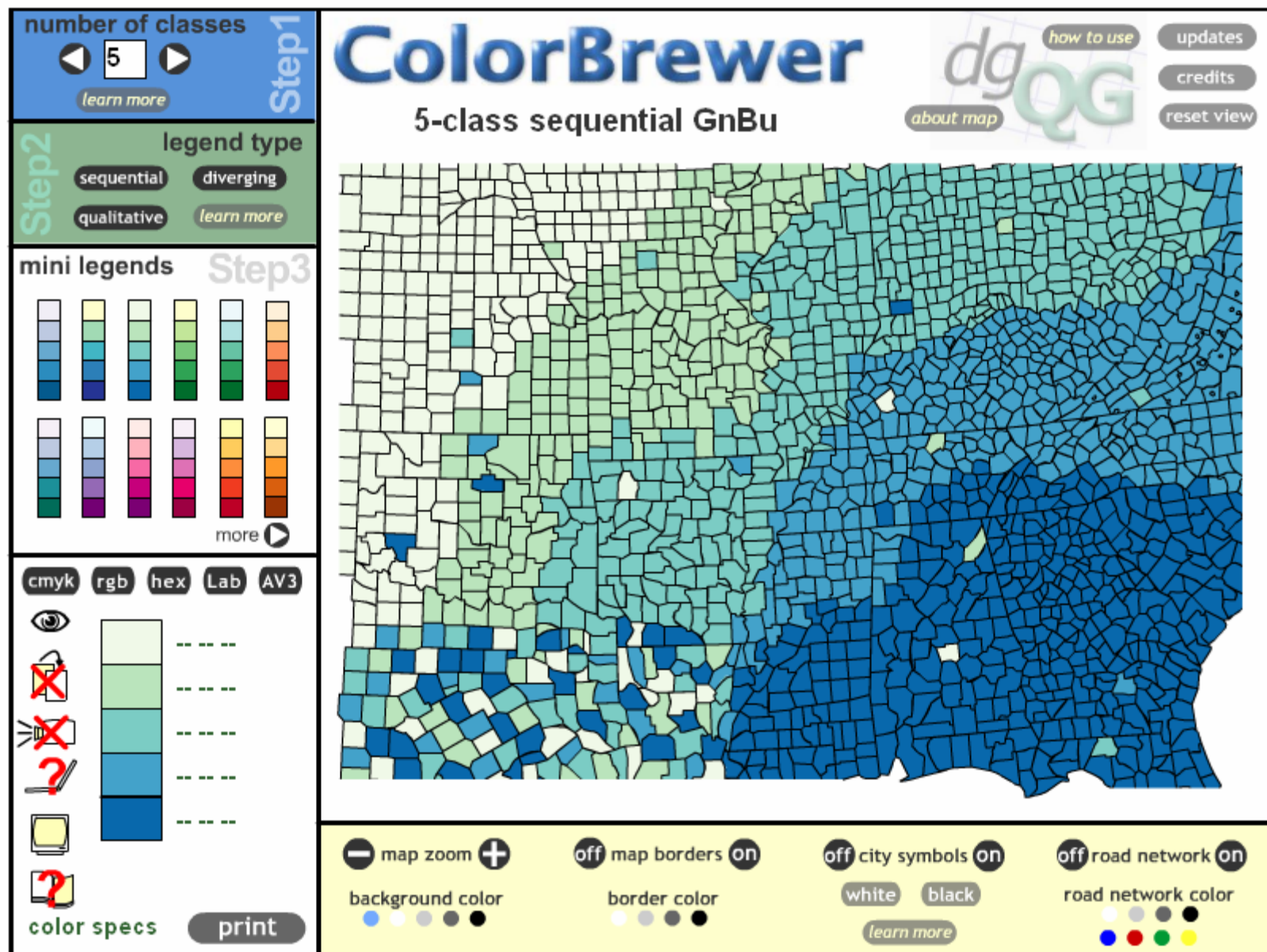
ColorBrewer

◀ 5 ▶
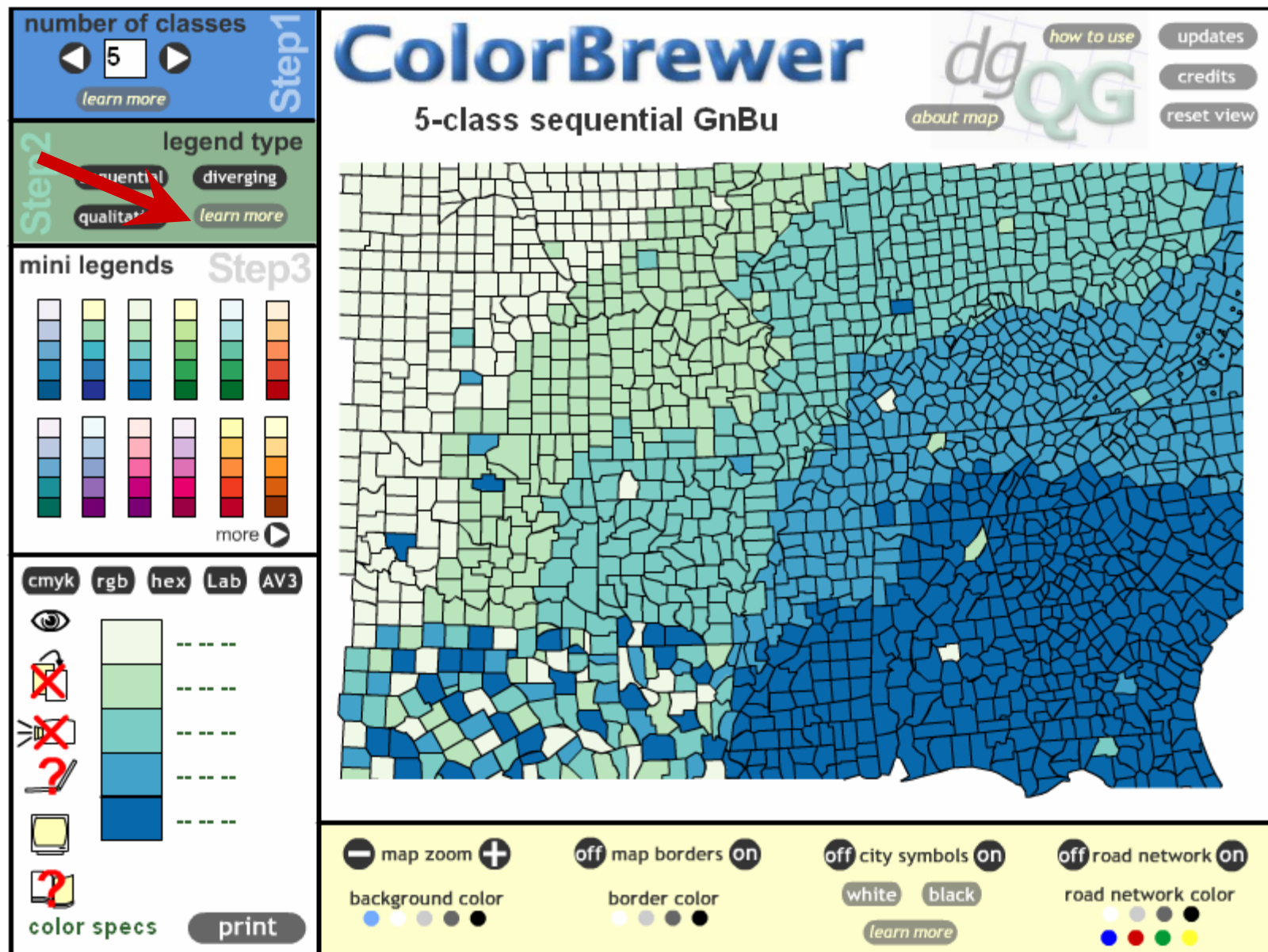
learn m...

Step2

sequential

qualitative

mini legends

cmyk | rgb | hex

color specs | print

Learn More: *Legend Type*

People per sq. mile by state

	300.0 to 9316.0
	79.6 to 299.9
	7.0 to 79.5
	1.1 to 6.9

1. Sequential schemes are suited to ordered data that progress from low to high. Lightness steps dominate the look of these schemes, with light colors for low data values to dark colors for high data values.

2. Diverging schemes put equal emphasis on mid-range critical values and extremes at both ends of the data range. The critical class or break in the middle of the legend is emphasized with light colors and low and high extremes are emphasized with dark colors that have contrasting hues.

Percent of total pop. under age 18 by state

	28.0 to 32.2
	25.7 to 27.9 *Nat'l Rate*
	24.0 to 25.6 *(critical value)*
	20.1 to 23.9

Group with highest percent of state population

	Hispanic
	White
	Black
	Asian

3. Qualitative schemes do not imply magnitude differences between legend classes, and hues are used to create the primary visual differences between classes. Qualitative schemes are best suited to representing nominal or categorical data.

These scheme types grow from the teaching of Dr. Judy Olson.

For more information:
Brewer, Cynthia A. 1994. Color use guidelines for mapping and visualization. Chapter 7 (pp. 123-147) in *Visualization in Modern Cartography*, edited by A.M. MacEachren and D.R.F. Taylor, Elsevier Science, Tarrytown, NY (Figures are online).

Other cartography publications by Cynthia Brewer

close

map zoom ⊖ ⊕

off map borders on
background color
border color

off city symbols on
white black
learn more

off road network on
road network color

Designing *better* MAPS

A Guide for GIS Users

Cynthia A. Brewer

MapShaper
development blog

About MapShaper

MapShaper is a free online editor for Polygon and Polyline Shapefiles. It has a Flash interface that runs in an ordinary web browser. Mapshaper supports three line simplification algorithms: Douglas-Peucker, Visvalingam-Whyatt, and a custom algorithm designed to smooth convoluted coastlines and spiky features.

The MapShaper project was conceived in 2005 by Matthew Bloch and Mark Harrower at the University of Wisconsin, Madison Geography Department. A paper [pdf] from the 2006 AutoCarto conference describes how MapShaper works "under the hood."

MapShaper is currently under development. This blog is intended to document the development process and let people test the latest version.

Enhanced Shapefile and EPS Output

September 5th, 2007

The latest online demo has expanded output options for map makers. MapShaper can now convert Polygon Shapefiles to Polyline Shapefiles and EPS files containing either lines or polygons. Converted Polyline Shapefiles contain an attribute field named "SHARED" that identifies those boundaries that are shared by two adjacent polygons. The polyline EPS output now uses a different color for shared and unshared boundaries.

MapShaper Demo

updated 5 Sep, 2007

launch

You can use this demo to upload and simplify your own Shapefiles, using one of three simplification methods. This version has enhanced Shapefile and EPS output functionality that can distinguish between inner and outer polygon boundaries.

MapShaper

editing: simplify smooth

export quit

Layer information
Imported coords: 208444
Approx. % retained: 0

Simplification method (?)
⦿ Douglas-Peucker
○ Visvalingam-Whyatt
○ Modified V-W

Display settings (?)
☑ show original lines
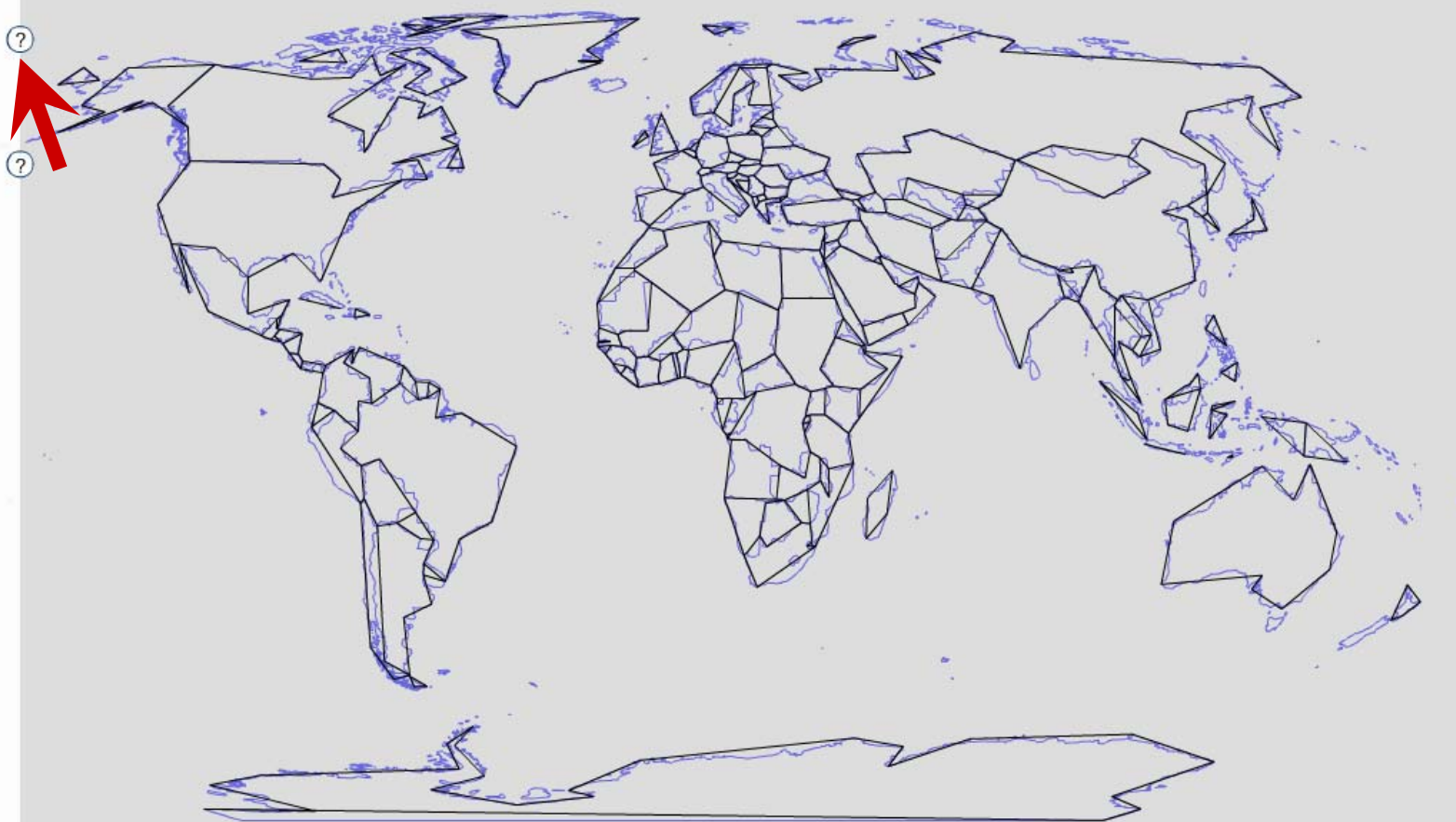line width
⦿ 1 pixel
○ 2 pixels
○ to scale [set]

menu   editing tools

simplification level   [100%]

zoom level   [90%]

MapShaper   editing: [simplify] smooth   export quit

Layer information
  Imported coords: 208444
  Approx. % retained: 100

Simplification method (?)
  (•) Douglas-Peucker
  ( ) Visvalingam-Whyatt
  ( ) Modified V-W

Display settings (?)
  [ ] show original lines
  line width
  (•) 1 pixel
  ( ) 2 pixels
  ( ) to scale [set]

The Douglas-Peucker algorithm is
commonly used in GIS systems, but may
yield a spiky appearance and is prone to
self-intersections.

Visvalingam-Whyatt is an alternative to
Douglas-Peucker that may create fewer self-
intersections.

We designed the "modified" version of the
Visvalingam-Whyatt algorithm to filter out
spiky features and small-scale jaggedness.

menu   editing tools   simplification level   zoom level

[ ] ↩ ↪ ✛ ▢ ⋮⁺ ⋮⁻   ↯ ○━━━━━━━━━━━━/ [0%]   ○ ⊕ ⊖ [90%]

TypeBrewer: A Map Design Help Tool for Selecting Typography

TypeBrewer is a free help tool that gives non-specialist mapmakers a chance to explore typography in a semi-structured environment. It is not mapmaking software. Instead of providing the functionality of a graphic design program or GIS, TypeBrewer offers a quick and easy way to explore typographic alternatives and see the impact that various elements of type have on the overall look and feel of a map. TypeBrewer is designed for mapmakers who want to learn more about map typography and get practical design specifications for starting a map project.

TypeBrewer templates are based on sound typographic and cartographic principles, as well as best professional practices. They can be applied to a wide range of possible projects:

To use TypeBrewer, you'll need the Adobe Flash Player, version 8 or higher.

Help me improve TypeBrewer by taking an online survey

Survey >>

Cap Height

x-Height

Baseline

Start >>

Cap Height

x-Height

Baseline

Start >>

Cap Height

x-Height

Baseline

Start >>

Typebrewer

	A	B	C
Formal			
Informal			
Classic			
Contemporary			

Formal | Informal | Classic | Contemporary

Tyrpeewer
BY

Formal

Formal templates can help contribute to a **formal** or **elegant** map look and feel.

	A	B	C
Informal			
Classic			
Contemporary			

T y p e B r e w e r

❷ EXPLORE Learn More >>

← Restart   ↻ Reload

FORMAL | A ▼

▬ Size
▬ Density
▬ Tracking

☑ **Terrain** ☑ **Highlight** ☐ **Text Only**

❸ GET SPECS Learn More >>

Map for: ● *Screen* ○ *Print*

Labels   Other Text

Countries
Font: Optima Demi
Size(pt): 11 - 22   *Track:* 0

Capital Cities
Font: Optima Roman
Size(pt): 15   *Track:* 0

Cities
Font: Optima Roman
Size(pt): 11.5   *Track:* 0

Mountains
Font: Optima Ital
Size(pt): 12 - 21   *Track:* 12 - 1250

Oceans
Font: Melior Ital
Size(pt): 11 - 17.5   *Track:* 0 - 50

Rivers
Font: Melior Ital
Size(pt): 11.5   *Track:* 12

Islands
Font: Optima Ital
Size(pt): 14   *Track:* 0

HELP

❹ COMPARE
Your Fonts   Font Alternatives   Font Info

Type Families: Optima / Melior

Map of Europe — Major Places and Natural Features

Sardinia (part of Italy) and Corsica (a region of France) are the 2nd and 4th largest islands in the Mediterranean. Their mild winter climates and beautiful beaches make them popular European tourist destinations.

EUROPE
Major Places and Natural Features

0   150   300 miles

Lambert Conformal Conic Projection

Info on Corsica and Sardinia: http://en.wikipedia.org
Places and Natural Features: CIA World Fact Book; http://www.cia.gov/cia/publications/factbook/

Joe Cartograper

Recommended for >> SCREEN | PRINT

❺ EXPORT Download the Template   Print Spec Sheet

Typebrewer

◄─ Restart   ↻ Reload

FORMAL | A ▾

Size

Density

Tracking

☑ Terrain   ☑ Highlight   ☐ Text Only

❸ GET SPECS   Learn More >>

❹ COMPARE

| Your Fonts | Font Alternatives | Font Info |

Type Families: Optima / Melior

Map for: ● Screen ○ Print

| Labels | Other Text |

Countries
Font: Optima Demi
Size(pt): 11 - 22   *Track:* 0

Capital Cities
Font: Optima Roman
Size(pt): 15   *Track:* 0

Cities
Font: Optima Roman
Size(pt): 11.5   *Track:* 0

Mountains
Font: Optima Ital
Size(pt): 12 - 21   *Track:* 12 - 1250

Oceans
Font: Melior Ital
Size(pt): 11 - 17.5   *Track:* 0 - 50

Rivers
Font: Melior Ital
Size(pt): 11.5   *Track:* 12

Islands
Font: Optima Ital
Size(pt): 14   *Track:* 0

Learn More   close ✖

Three ways to explore type: Size, Density, Tracking

These elements of map typography have an impact on legibility, help categorize and classify map features, create visual hierarchy, and change the overall look and feel of a map.

1) Size

Size plays a critical role in determining type legibility. It can also help to communicate the relative importance of features and, in some cases, be used to encode data (e.g., population values). If feature categories are to be distinguished by size, a difference of at least 2 points is necessary.

The size of type is most commonly measured in points (1 inch = 72 pts). Other measures include picas (12 pts = 1 pica), inches, millimeters, and pixels. Size refers to the height of a letter. For a given typeface, it is measured from the top of the capital letter to the bottom of the letter with the lowest descender. This is a holdover from metal type setting, in which all characters in a font had to fit on a slug of the same body size to ensure uniform printing. It is important to note that different typefaces at the same point size can have different heights. Point size alone should never be used to determine legibility.

24 pt Avant Garde Std   24 pt Adobe Jenson Pro

On the computer, type is rendered by converting points to pixels. Several factors can impact the size of type displayed on screen. The number of pixels per inch that one application (or operating system) uses to calculate height can differ from another. In other words, the same typeface at the same size can have different heights when viewed in different software. Most graphic design software uses 72

Recommended for >> SCREEN | PRINT   ❺ EXPORT | Download the Template | Print Spec Sheet

← Restart   ⟳ Reload

FORMAL | A   ▾

Size

Density

Tracking

☑ Terrain   ☑ Highlight   ☐ Text Only

❸ GET SPECS   Learn More >>

Map for: ● Screen ○ Print

Labels   Other Text

Countries
Font: Optima Demi
Size(pt): 11 - 22   Track: 0

Capital Cities
Font: Optima Roman
Size(pt): 15   Track: 0

Cities
Font: Optima Roman
Size(pt): 11.5   Track: 0

Mountains
Font: Optima Ital
Size(pt): 12 - 21   Track: 12 - 1250

Oceans
Font: Melior Ital
Size(pt): 11 - 17.5   Track: 0 - 50

Rivers
Font: Melior Ital
Size(pt): 11.5   Track: 12

Islands
Font: Optima Ital
Size(pt): 14   Track: 0

❹ COMPARE

Your Fonts   Font Alternatives   Font Info

Type Families: Optima / Melior

About TypeBrewer   close ✖

Resources in Print

Typography

--Bringhurst, Robert. 2005. *The Elements of Typographic Style*. 3.1 ed. Point Roberts, WA: Hartley & Marks. See chaps. 3, 6, 9, 11.

--Carter, Rob, Ben Day, and Philip Meggs. 2002. *Typographic Design: Form and Communication*. 3rd ed. Hoboken, NJ: John Wiley & Sons. See chaps. 2 and 4.

--Lupton, Ellen. 2004. *Thinking with Type: A Critical Guide for Designers, Writers, Editors, and Students*. New York: Princeton Architectural Press. See pgs. 13-57.

--Meggs, Philip, and Rob Carter. 1993. *Typographic Specimens: The Great Typefaces*. New York: Van Nostrand Reinhold.

--Perfect, Christopher, and Gordon Rookledge. 2004. *Rookledge's Classic International Type Finder: The Essential Handbook of Typeface Recognition and Selection*. London: Laurence King.

Typography + Cartography

--Brewer, Cynthia A. 2005. *Designing Better Maps: A Guide for GIS Users*. Redlands, CA: ESRI Press. See chaps. 2 and 3.

--Slocum, Terry A., Robert B. McMaster, Fritz C. Kessler, and Hugh H. Howard. 2005. *Thematic Cartography and Geographic Visualization*. 2d ed. Upper Saddle River, NJ: Pearson Prentice Hall. See chap. 11.3.

Resources on the Web

Recommended for >> SCREEN | PRINT

❺ EXPORT   Download the Template   Print Spec Sheet

HOW TO USE TYPEBREWER

Follow the 5 steps below:

1. **Select** a template that contains pre-made combinations of typefaces and styles
2. **Explore** ways of altering the template
3. **Get Specs** for all of the labels and other text in the template
4. **Compare** fonts in the template to each other and to the fonts on your computer
5. **Export** the template by downloading an Illustrator file or printing it with its specs

❶ SELECT Learn More >>

Formal | Informa | Classic | Contemporary

Formal

ITALY
VATICAN
CITY★
rsica   Rome
dinia   Naples
Shiraz

dinia

Select one of twelve possible templates arranged in four main categories.

Help

mal

ITALY
VATICAN

Adriatic Sea

Compare (a) your fonts to template fonts, (b) a number of possible font alternatives, and (c) detailed font info for all template fonts.

❷ EXPLORE Learn More >>

Done   🌐 Internet

CV1 History and trends
- ☐ CV1-1 History of cartography
- ☐ CV1-2 Technological transformations

CV2 Data considerations
- ☐ CV2-1 Source materials for mapping
- ☐ CV2-1 Data abstraction: classification, selection and generalization ⬅
- ☐ CV2-3 Projections as a map design issue

CV3 Principals of map design
- ☐ CV3-1 Map design fundamentals
- ☐ CV3-2 Basic concepts of symbolization
- ☐ CV3-3 Color ⬅
- ☐ CV3-3 Typography ⬅

CV4 Graphic representation techniques
- ☐ CV4-1 Basic thematic mapping methods
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- ☐ CV4-9 Visualization of uncertainty

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- ☐ CV5-1 Computational issues in cartography and visualization
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- ☐ CV6-4 Map analysis
- ☐ CV6-5 Evaluation and testing
- ☐ CV6-6 Impact of uncertainty

Key

Making maps

Web sites

- Tools for map makers
  - colorbrewer.org
  - mapshaper.org
  - typebrewer.org
- Forum - user community exchange
  - cartotalk.com
- Hybrid ?
  - MappingCenter.esri.com

CartoTalk **A Public Forum for Cartography and Design**

[Go]
More Search Options

Home | Help | Members map | Members | Resources | Calendar

Welcome Guest (Log In | Register)

cartographica

» CartoTalk

Who is the community?

General ⊟

Forum	Topics	Replies	Last Post Info
CartoTalk Announcements General announcements and information about this web site.	62	500	Jan 21 2008, 01:33 PM **In:** CartoTalk Skin Redesign **By:** Nick S.
News & Press Releases Cartography and design related news and info.	174	462	Yesterday, 08:38 AM **In:** MAPublisher 7.6 for Adobe Illu... **By:** Ted Florence
Interesting Links Links to cartography and map sites.	370	1,040	Yesterday, 04:50 PM **In:** Gap Minder's Trendalyzer **By:** Speer_man
Introductions Introduce yourself here so we can get to know you better.	179	760	Yesterday, 09:40 PM **In:** Fly fisherman who loves making... **By:** dsalbany1
Off Topic For anything not related to cartography/mapping/design. Fun stuff encouraged.	151	1,275	Jan 18 2008, 05:26 PM **In:** Happy Birthday Nick! **By:** Jean-Louis

Discussions ⊟

Forum	Topics	Replies	Last Post Info
Map Gallery Post your map designs here and get feedback from other cartographers. Attach images up to 500kb or link to any size image on your own server.	189	1,490	Today, 01:58 AM **In:** Map template for Atlas **By:** MapMedia
General Cartography Any topics related to cartography	204	1,296	Today, 12:59 PM **In:** Software Tests **By:** Erin
Cartographic Design Topics related to the visual design of maps	116	758	Jan 17 2008, 08:35 PM **In:** Cartographic Perspectives colu... **By:** sean

Web sites

- ☐ Tools for map makers
  - ■ colorbrewer.org
  - ■ mapshaper.org
  - ■ typebrewer.org
- ☐ Forum - user community exchange
  - ■ cartotalk.com
- ☐ Hybrid ?
  - ■ MappingCenter.esri.com

| Visits 27,160 % of Site Total: 100.00% | Pages/Visit 3.93 Site Avg: 3.93 (0.00%) | Avg. Time on Site 00:03:23 Site Avg: 00:03:23 (0.00%) | % New Visits 35.11% Site Avg: 35.09% (0.07%) | Bounce Rate 48.39% Site Avg: 48.39% (0.00%) |

Country/Territory	Visits	Pages/Visit	Avg. Time on Site	% New Visits	Bounce Rate
United States	17,419	4.02	00:03:16	32.25%	48.65%
Canada	1,769	4.15	00:03:36	42.62%	48.45%
United Kingdom	709	3.55	00:03:47	41.75%	47.95%
Australia	588	4.37	00:04:43	28.23%	40.82%
Germany	548	3.76	00:03:04	38.87%	44.71%
Italy	262	3.49	00:02:45	48.47%	52.29%
China	260	3.22	00:03:51	44.23%	50.77%
Poland	255	3.54	00:02:47	47.45%	56.86%
Israel	250	3.67	00:03:16	23.20%	48.40%
New Zealand	242	2.80	00:03:09	26.45%	61.16%
Czech Republic	238	3.55	00:02:16	43.70%	47.48%
Spain	225	3.87	00:03:59	46.67%	47.56%
Brazil	215	3.57	00:04:42	32.56%	50.23%
France	185	2.98	00:02:22	48.11%	56.22%
India	175	2.74	00:02:29	53.71%	54.86%

Japan	**174**	4.10	00:03:38	12.64%	52.87%
Netherlands	**170**	3.65	00:03:06	38.82%	48.24%
Mexico	**147**	4.17	00:03:43	42.86%	38.78%
Belgium	**141**	2.98	00:01:54	25.53%	58.16%
South Africa	**120**	4.68	00:06:08	47.50%	38.33%
Switzerland	**116**	4.11	00:04:03	54.31%	43.10%
Greece	**116**	5.80	00:04:32	40.52%	37.07%
Thailand	**111**	2.30	00:02:16	57.66%	61.26%
Portugal	**104**	4.36	00:03:29	50.96%	35.58%
Austria	**101**	3.86	00:04:20	44.55%	39.60%
Sweden	**100**	3.09	00:02:53	32.00%	48.00%
Turkey	**98**	4.17	00:05:25	36.73%	38.78%
Bulgaria	**95**	2.51	00:01:20	13.68%	80.00%
South Korea	**92**	5.27	00:05:12	29.35%	38.04%
Indonesia	**91**	4.09	00:05:44	56.04%	52.75%
Russia	**87**	3.21	00:02:01	45.98%	51.72%
Norway	**76**	3.51	00:03:02	36.84%	47.37%
Iran	**69**	2.80	00:02:46	59.42%	44.93%
Colombia	**64**	4.55	00:07:04	46.88%	35.94%
Philippines	**63**	3.16	00:03:29	38.10%	42.86%

Chile	60	3.48	00:02:38	40.00%	46.67%
Hong Kong	59	3.88	00:04:01	28.81%	52.54%
Saudi Arabia	58	3.34	00:02:42	37.93%	55.17%
Argentina	56	4.20	00:05:43	51.79%	44.64%
Slovenia	53	2.66	00:01:44	22.64%	64.15%
Malaysia	51	3.84	00:02:58	56.86%	56.86%
Moldova	50	2.42	00:01:06	2.00%	50.00%
Denmark	48	3.17	00:02:20	37.50%	50.00%
Romania	47	4.34	00:03:22	51.06%	29.79%
Egypt	45	3.00	00:05:32	48.89%	40.00%
Laos	44	3.91	00:03:31	6.82%	43.18%
Serbia and Montenegro	42	4.55	00:07:10	42.86%	28.57%
Vietnam	41	2.63	00:04:33	29.27%	48.78%
Slovakia	41	4.83	00:04:14	53.66%	31.71%
United Arab Emirates	40	3.65	00:03:50	35.00%	52.50%

Visitors Overview

● Visitors

10,479 people visited this site

27,160 Visits

10,479 Absolute Unique Visitors

106,664 Pageviews

3.93 Average Pageviews
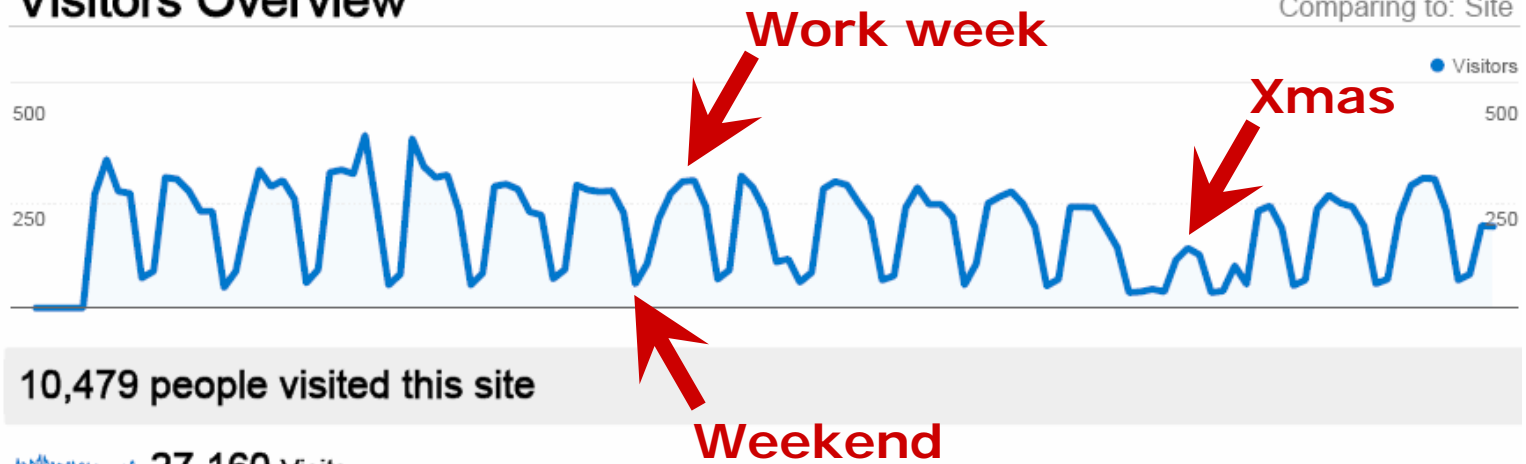
00:03:23 Time on Site

48.39% Bounce Rate

35.12% New Visits

Technical Profile

Browser	Visits	% visits
Internet Explorer	19,079	70.25%
Firefox	7,450	27.43%
Safari	327	1.20%
Opera	185	0.68%
Netscape	49	0.18%

Connection Speed	Visits	% visits
Unknown	10,558	38.87%
T1	7,180	26.44%
DSL	4,890	18.00%
Cable	3,390	12.48%
Dialup	1,033	3.80%

mappingcenter.esri.com

Visitors Overview

Sep 20, 2007 - Jan 22, 2008
Comparing to: Site

Work week

Xmas

● Visitors

500

250

500

250

Weekend

10,479 people visited this site

27,160 Visits

10,479 Absolute Unique Visitors

106,664 Pageviews

3.93 Average Pageviews

00:03:23 Time on Site

48.39% Bounce Rate

35.12% New Visits

Technical Profile

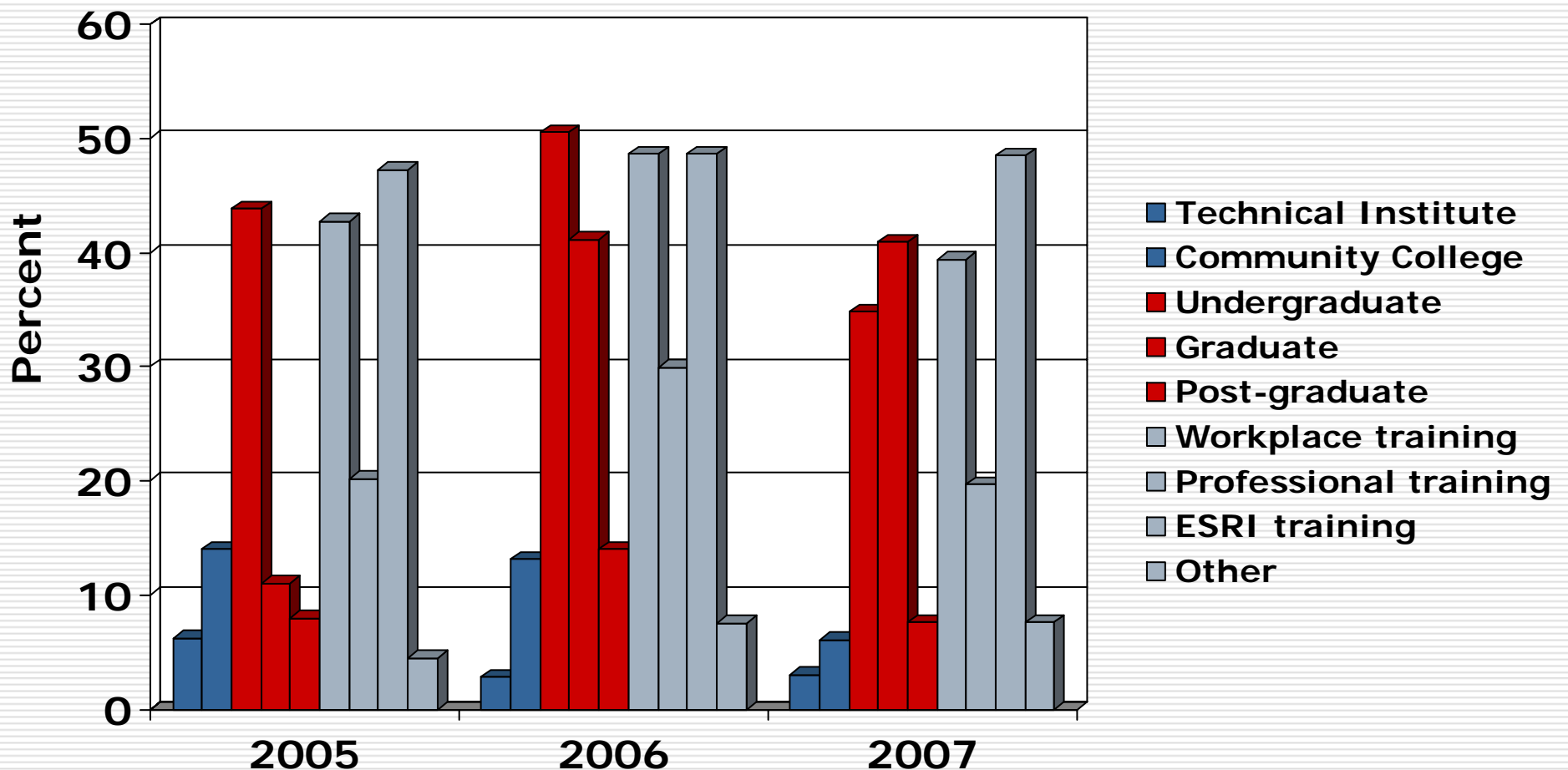| Browser	Visits	% visits	Connection Speed	Visits	% visits
Internet Explorer	19,079	70.25%	Unknown	10,558	38.87%
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Safari	327	1.20%	DSL	4,890	18.00%
Opera	185	0.68%	Cable	3,390	12.48%
Netscape	49	0.18%	Dialup	1,033	3.80%

ESRI UC – Map Gallery Participant Survey

Have you received formal cartographic or map production education?
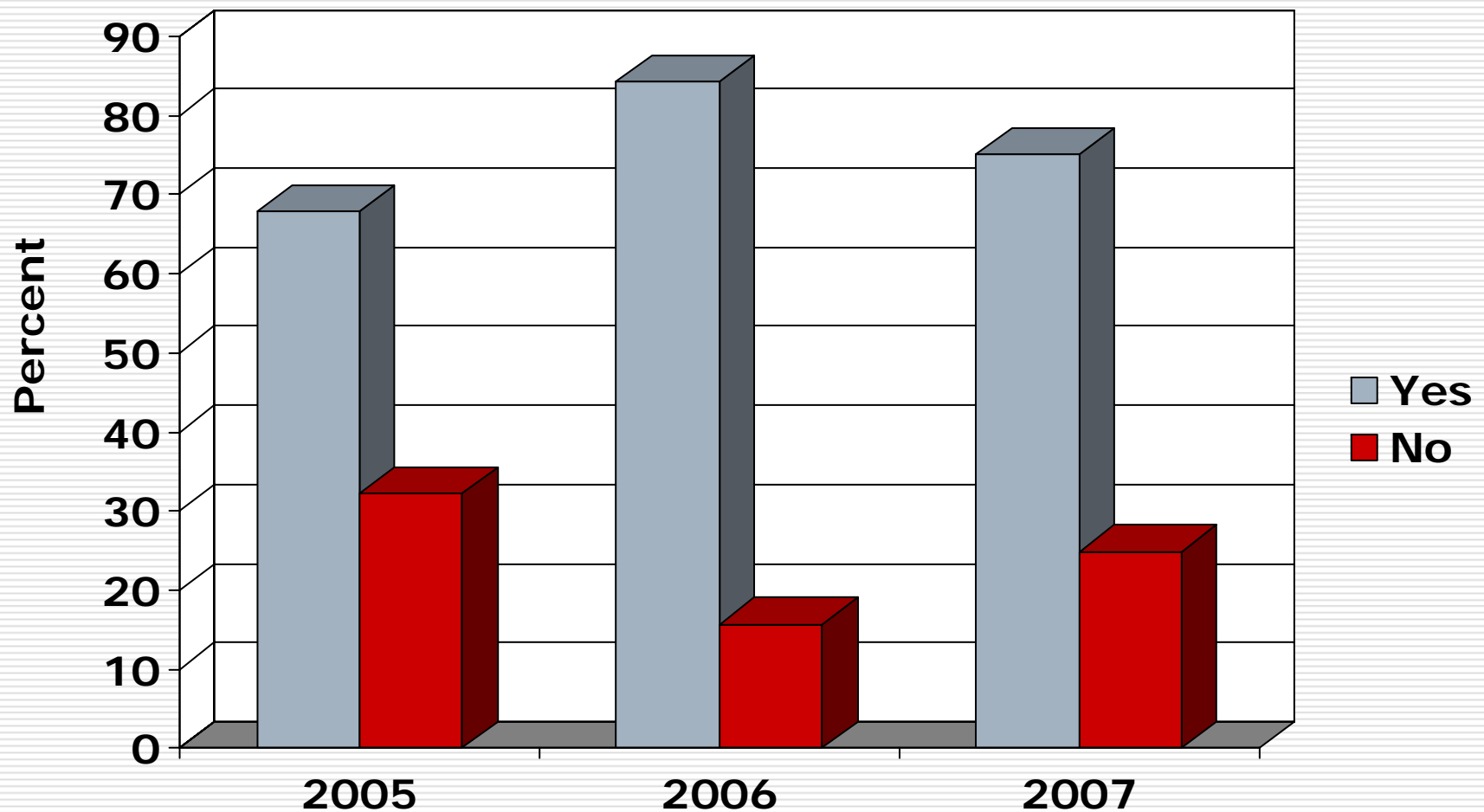
ESRI UC – Map Gallery Participant Survey

If so, what level of this education have you received?

CV1 History and trends
- ☐ CV1-1 History of cartography
- ☐ CV1-2 Technological transformations

CV2 Data considerations
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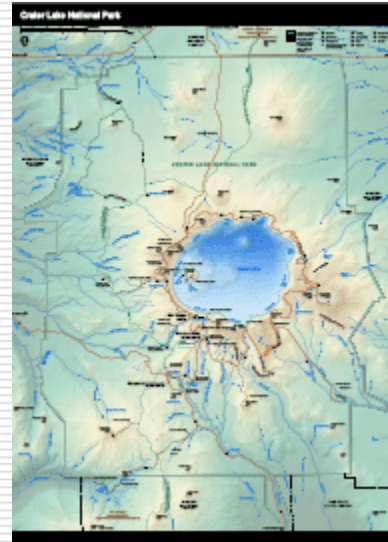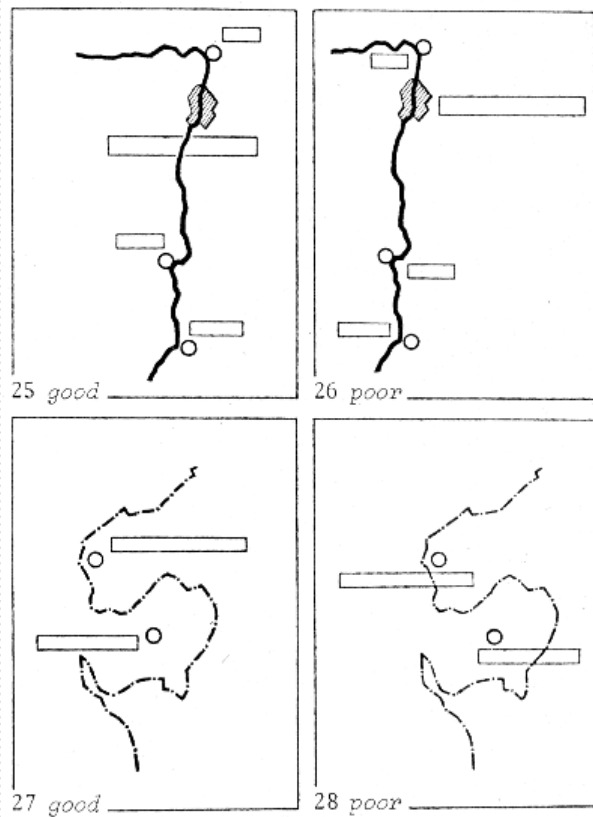Key

Making maps

Making special types of map

Using maps

Future Additions to Mapping Center

- ☐ The Cartographer's Eye
  - ■ Map critique
- ☐ Teaching Materials
  - ■ Relief Representation
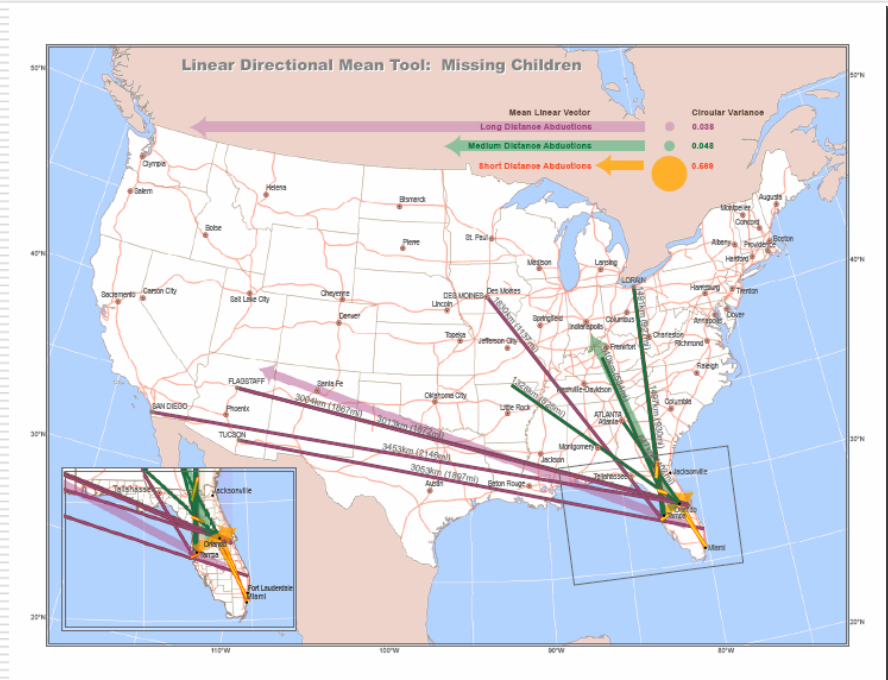 - ■ Basic Cartographic Design

The Cartographer's Eye

☐ *a la* Imhof*

The Cartographer's Eye

- "This place looks an island with a lot of rivers."

- "What do the arrows mean?"

- "What do their colors mean?"

- "I can't see what's happening in Florida."

Teaching Materials

☐ Useful to teach a one-day workshop (university or anywhere) or to teach yourself

- ■ Lecture
  - ☐ PowerPoints with bottom notes
- ■ Labs
  - ☐ Data sets, styles, expressions, statements, .MXDs, step-by-step instructions, whatever is needed

Terrain Representation

- ☐ Morning – The Basics
  - ■ Data
  - ■ DEM Manipulation
  - ■ Hillshading
  - ■ Layer Tinting
- ☐ Afternoon - Advanced Topics
  - ■ Advanced DEM Manipulation
  - ■ Advanced Hillshading Techniques
  - ■ Modifications to Layer Tinting
  - ■ Bump Mapping
  - ■ Vegetation
  - ■ Illuminated Contours
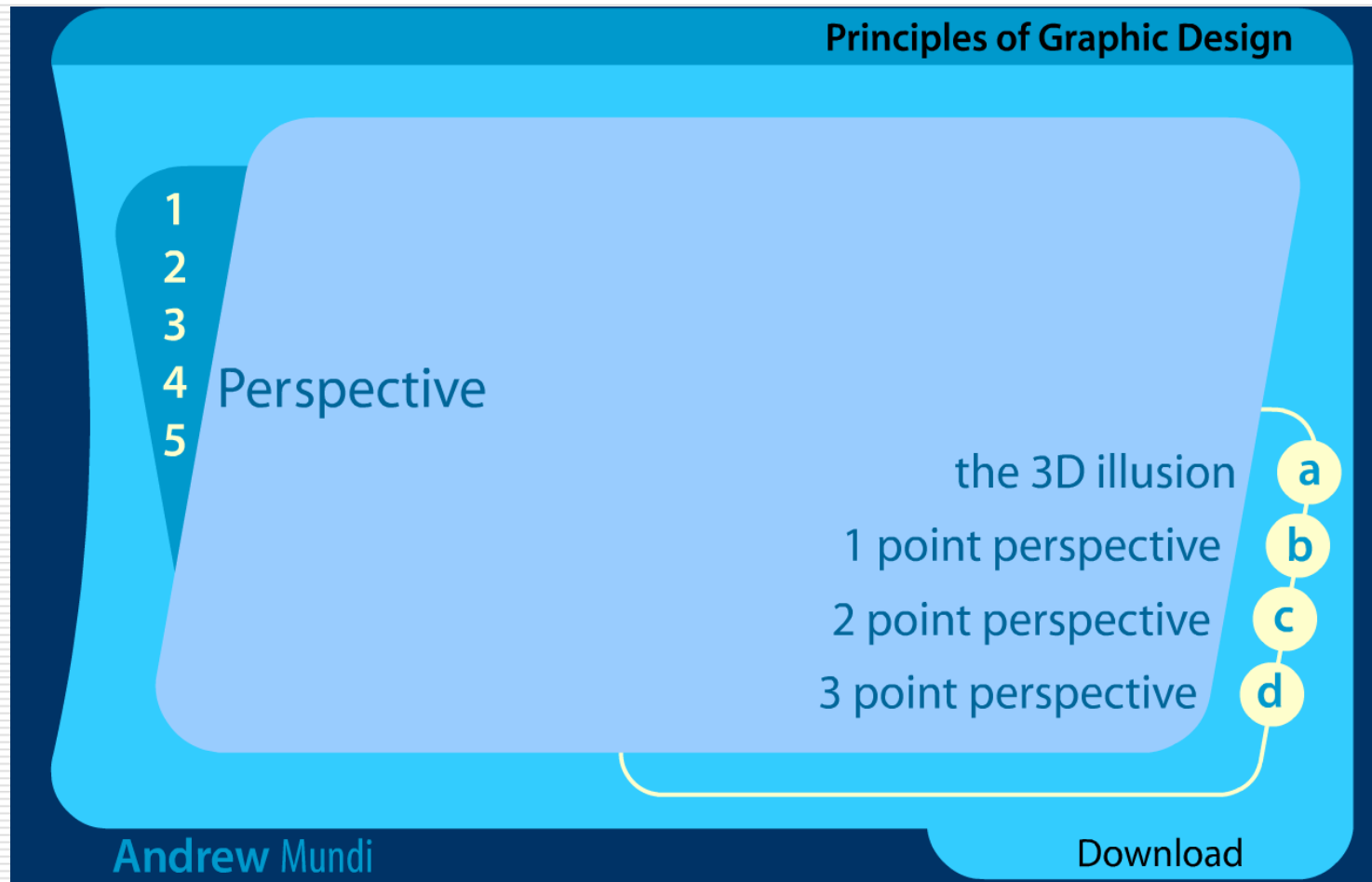 - ■ Printing and Output

- ☐ Final Project

- ☐ Related readings
  - ■ Imhof – *Relief Presentation*, with attention to selected sections
  - ■ Tom Patterson – selected readings
  - ■ Jeff Nighbert – Bump mapping
  - ■ Kennelly and Kimerling – Tanaka's illuminated contours
  - ■ David Barnes – Swiss Hillshade
  - ■ David Mark – MDOW hillshade

Basic Cartographic Design

☐ After Andrew Mundi's Graphic Design

Evolution or Devolution of Cartographic Education?

Transformations in Teaching Cartographic Concepts and Techniques

Evolution AND Devolution of Cartographic Education

Continuing to Transform How We Teach Cartographic Concepts and Techniques

Evolution AND Devolution of Cartographic Education

Continuing to Transform How We Teach Cartographic Concepts and Techniques

- Evolution of cartography classes
- Devolution of cartography education
  - Methods, teachers, audience

Evolution AND Devolution of Cartographic Education

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