



# Map Reproduction



GEOG380 FA2018

# Outline

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- ▶ Copyright and liability
- ▶ Editing
- ▶ Printing hardware considerations



# Map reproduction

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- ▶ The most frequently-considered step in map design in narrow meaning
  - ▶ E.g., modification of existing maps

## Step 1

Consider what the real-world distribution of the phenomenon might look like

## Step 2

Determine the **purpose** of the map and its intended audience

## Step 3

Collect data appropriate for the map's purpose

## Step 4

**Design and construct** the map

## Step 5

Determine whether users find the map useful and informative

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# Copyright and liability/editing

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# Caution! - A few notes on copyright

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- ▶ Copyright follows the originality doctrine:
  - ▶ Requires that there has to be some “**intellectual invention**”
  - ▶ Maps require only **a minimal degree** of creativity (in selection, coordination, or arrangement) to be protected
    - ▶ Good or bad?
- ▶ Following the above, the vast majority of maps qualify as copyright-protected



# Caution! - A few notes on copyright (cont.)

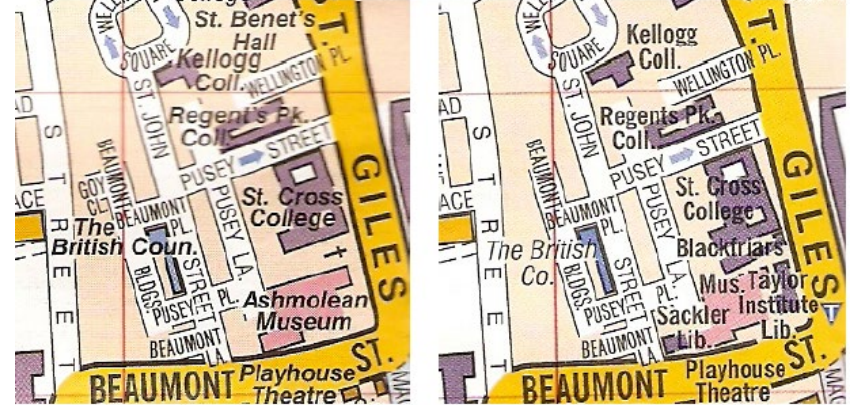
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- ▶ So, you cannot “copy” (i.e. reproduce exactly the same) another map without asking for **a permission**
  - ▶ Usually, : **manual digitizing** → OK
  - auto-tracing, scanning, or screen-capturing** → **NOT OK**
  - ▶ Your **symbolization, compilation** → OK (= intellectual invention)
- ▶ Most U.S. government-agency maps are public domain, i.e., free-to-use (with providing **credit/source info**)
  - ▶ Note: this is often NOT the case in other countries



# Copyright traps, hooks

- ▶ These are Beaumont Buildings in Oxford, UK
- ▶ An original map (left) vs. another map created later (right)



*Any copyright issue?*

# Copyright of GIS data

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- ▶ What are **redistribution rights** for the data from ESRI (one of major GIS software vendors) frequently used in GIS courses?
- ▶ Look for “Redistribution rights” page of ESRI
  - ▶ <http://www.esri.com/legal/redistribution-rights>

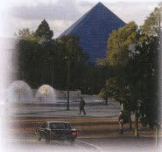




# Trademark licensing

## ex) CSULB's Trademark Licensing Program

**California State University Long Beach** was founded in 1949. Today, the university has an enrollment of more than 37,000 and has been ranked among the "Best in the West" by the Princeton Review. Long Beach State competes at the NCAA Division I level as members of the Big West Conference and fields 14 men's and women's varsity sports. Athletic teams are known as the 49ers and the Dirtbags (baseball only).



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All names and visual representations of California State University, Long Beach/Long Beach State are considered its "trademarks." This includes all word marks, service marks, names, name variants, nicknames, logotypes, logos, insignia, shields, seals, designs, devices or symbols that refer to the university. Also included are any words, phrases or images that imply association with CSULB or Long Beach State.

### What are the University's Trademarks and Colors?

The graphics shown below represent only some of the logos and wordmarks included in the University's official graphic standards guide. This is available to all licensed vendors as part of their license agreement.

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The Beach™  
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Dirtbags™  
The Pyramid™

CSULB™  
LBSU™



Beach Gold  
Pantone® 109



Long Beach Gold  
Pantone® 123



Long Beach Red  
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Long Beach Black  
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Manufacturers, producers and any other entities that plan to use the trademarks of the university must complete the licensing process and carry an agreement prior to producing, distributing, and selling emblematic merchandise. This includes the use of logos and wordmarks on all products intended for retail, promotional use, fund raising, university and student organization use, including give-aways.

### What is CSULB's Royalty Rate?

The royalty rate is 8%, which is charged on the wholesale price of each item. The royalty revenue generated from the sale of licensed products is used to support campus groups, departments and athletics. Products purchased by the 49er Shops, Inc. are exempt from royalties. CSULB campus purchases not intended for resale are also royalty-exempt.



### How Can a License Be Obtained?

All products bearing the CSULB/Long Beach State name, logos and trademarks used in any color, lettering style or combination, must be licensed. Cal State Long Beach has contracted with the Licensing Resource Group, Inc. (LRG) to manage the licensing process on their behalf.

For Manufacturers: Contact LRG directly or log onto [www.lrgusa.com](http://www.lrgusa.com) to obtain an application for license. The application will need to be completed and returned along with the required elements in order to be considered for a license with Cal State Long Beach.

Once the application has been approved, LRG will send a licensing packet with an agreement along with a list of the elements needed to obtain and sustain a license with the university. Each manufacturer is required to keep their license in good standing in order to produce any products bearing any reference to CSULB/Long Beach State. This includes proper insurance coverage, adherence to all required codes of conduct, design approvals, and remitting quarterly royalty payments.

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If a department or organization is purchasing products for university use or give-away, the product must be obtained through a licensed manufacturer and the intended design approved by LRG, prior to production; however, these products are royalty-exempt.

To determine if a particular manufacturer is licensed, or to find a licensed vendor to produce your product, visit [www.lrgusa.com](http://www.lrgusa.com) and click on the "resources" tab. You will find a real-time report under the "licensed vendors" link.

### Are There Products That Are Restricted?

Cal State Long Beach will not license alcoholic products, smoking paraphernalia or any product considered dangerous or offensive in any way or that do not represent the quality and integrity associated with CSULB. The university will also not approve any design that is derogatory or offensive.

(source: Licensing Resource Group, Inc. 49er Shops, Inc.)

# Liability Issue

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*“This map should not be used for navigation.  
It is intended for reference-use only”*

- ▶ More than copyright violation lead to lawsuits because of the liability problem
  - ▶ You should make reasonable efforts to **reduce errors** in the map as much as possible
  - ▶ You are liable for “**deceptive design**” or “**misleading artifacts**” in your map as well
  - ▶ Proper **citation** of sources and manipulation is mandatory
- 



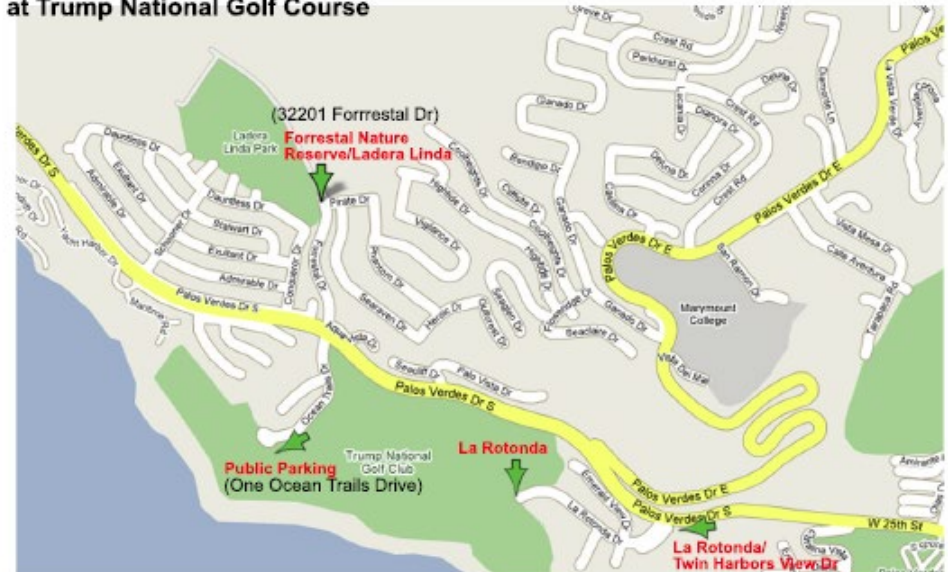
# Example

- ▶ Maps from  
LOS SERENOS de  
POINT VICENTE  
2010 Hike Calendar

Map showing Point Vicente Interpretive Center and Abalone Cove Park



Map showing Forrestral Nature Reserve/Ladera Linda and Ocean Trails Reserve at Trump National Golf Course



NOTE: Maps are NOT to scale and are to be used as a guideline for the location of the parks.

# Editing – put your map to the test

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- ▶ You should know by now that mapping is **not just a follow-the-rules process**
  - ▶ Rules are made to be broken
  - ▶ Defaults in software are made to be discarded  
ex. A bar chart in a default-design from s/w
  - ▶ Engage your mind for creativity
- ▶ Similar to text-editing
  - ▶ Hard to find **errors** in your own work
    - ▶ (Even if after 10 reviews...)
  - ▶ Fresh eyes, sections, upside-down, and pauses
    - ▶ Peer reviews will help!



# Editing

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- ▶ Does the design work?
  - ▶ Re-visit your thoughts about ...
    - ▶ Intended audience and map purpose
    - ▶ Design goals, intellectual & visual hierarchies
- ▶ Anything missing?
  - ▶ Make sure that all the important elements are there
  - ▶ Have someone else use/criticize your map ([peer review](#))
- ▶ Everything correct?
  - ▶ Check for typos, placement, alignment, copyright, etc
  - ▶ Again, have someone else use/criticize your map with fresh eyes





# Example terms for peer review

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- ▶ Confusing – Clear
- ▶ Light – Dark
- ▶ Crowded – Empty
- ▶ Neat – Sloppy
- ▶ Elegant – Crude
- ▶ Timid – Bold
- ▶ Complex – Simple
- ▶ Coherent – Fragmented
- ▶ Interesting – Boring
- ▶ Modern – Traditional
- ▶ Authoritative – Unauthoritative
- ▶ High contrast – Low contrast
- ▶ Structured – Amorphous
- ▶ Balanced – Lopsided

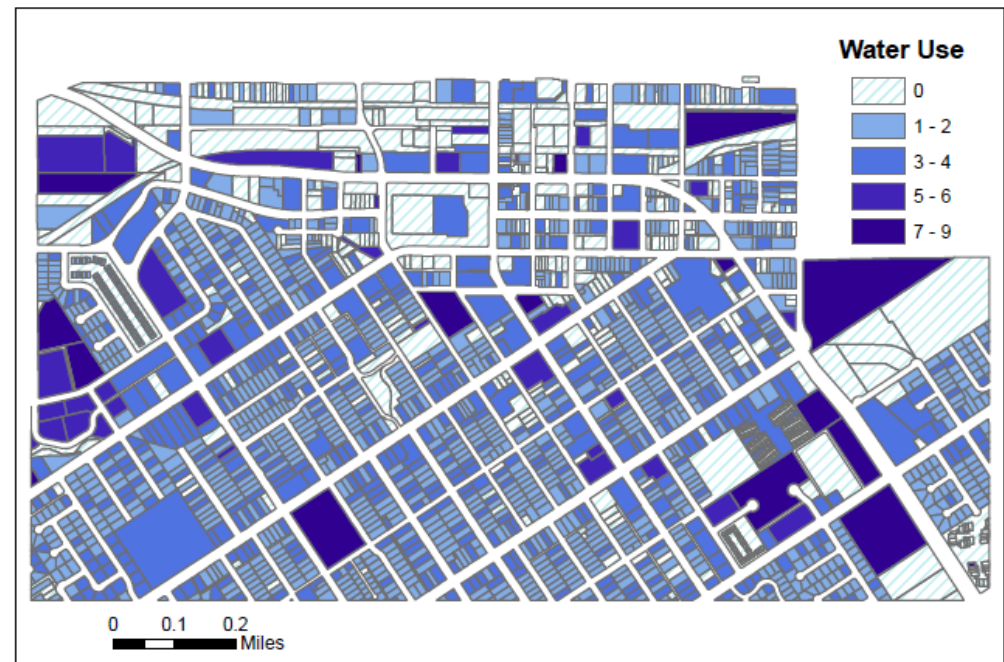
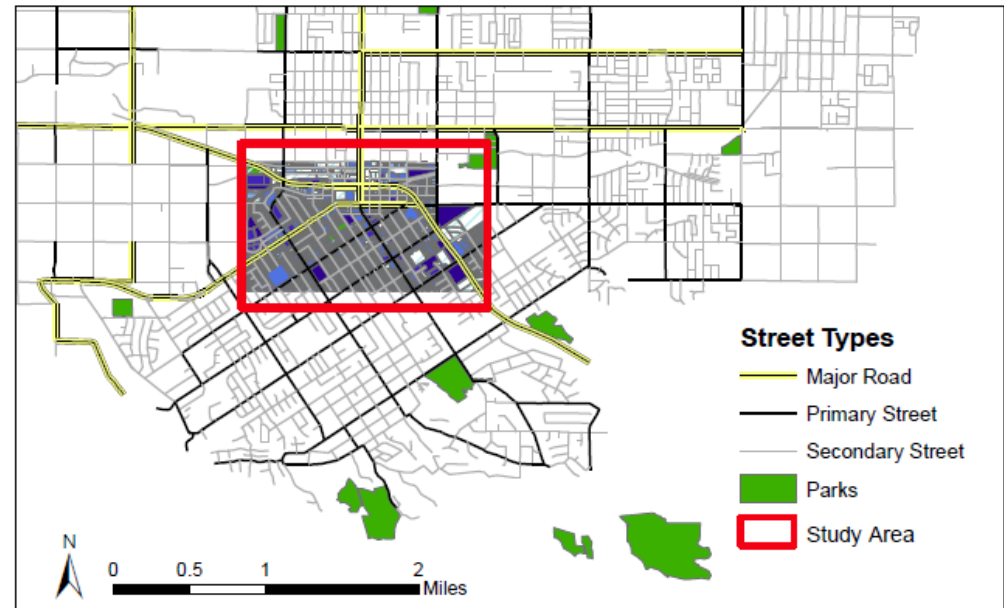
*Can be useful for your PM3 (your peer review for draft maps by others)*



# Group Activity

- ▶ Review the map on the right side based on the example terms for peer review on slide p.14 and design guidelines of map elements in the previous lectures (alignment, redundancy, eye movement, visual center, etc.)

Water Consumption in Green Valley, CA



# Things to consider when representing your maps using media and materials

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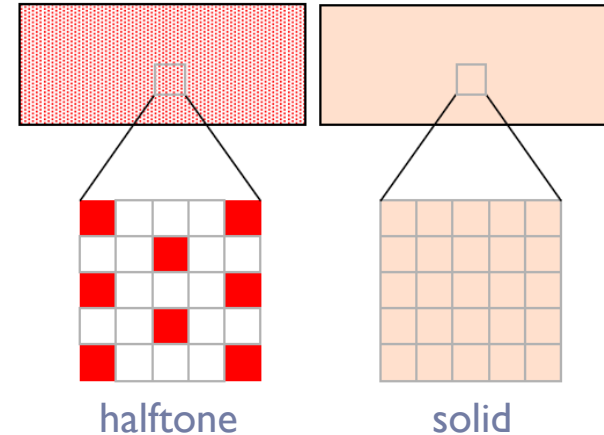
- ▶ Screening (halftoning)
- ▶ Fine line-art
- ▶ Printing hardware considerations





# Screening (Halftoning)

- ▶ Used to produce a full color-spectrum **from a limited number** of colors
- ▶ Less saturation than CMYK



- ▶ **Parameters**

- ▶ Percentage



- ▶ Type



- ▶ Frequency (LPI: Lines Per Inch)



- ▶ Angle (degrees)



*Moire effects!*

# Activity

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- ▶ Try halftoning in ArcMap
  - ▶ Add “Lab I data B” to ArcMap.
  - ▶ Open Symbol Selector and choose 10% Ordered Stipple. Click on Edit Symbol... button
  - ▶ Click on Fill Properties tab. Modify Offset and Separation values and see what happens.
  - ▶ In addition, click on Picture Fill tab. Modify Angle, Scale X, and Scale Y values and see what happens.



# Some screening considerations

- ▶ **Fine line-art type** may be lost or distorted during screening
  - ▶ Saturation limitation
    - ▶ A screen has empty space between dots
  - ▶ Consider spot color (solid) or a combination of CMYK & spot color
- ▶ Topographic map examples



# Printing hardware considerations:

## Hardware for printing maps

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- ▶ Ink-jet printers
  - ▶ Use liquid inks (CMYK)
  - ▶ Screening provides different hue, saturation, and intensity
  - ▶ “CMYK 4 color offset printing” <https://www.youtube.com/watch?v=MHoFPivJl2I>
- ▶ Laser printers
  - ▶ Use toner dusts (CMYK)
  - ▶ Screening provides different hue, saturation, and intensity
  - ▶ “how a color laser printer works” <http://www.youtube.com/watch?v=hEj0SsCstlM>
- ▶ Offset lithographic-press (next slide)
  - ▶ Uses any inks (spot color such as PANTONE® system, process color such as CMYK)
  - ▶ Screening (or halftoning; later slide) and/or solid colors (ex. gray) provide different hue, saturation, and intensity

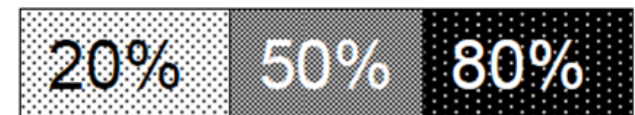
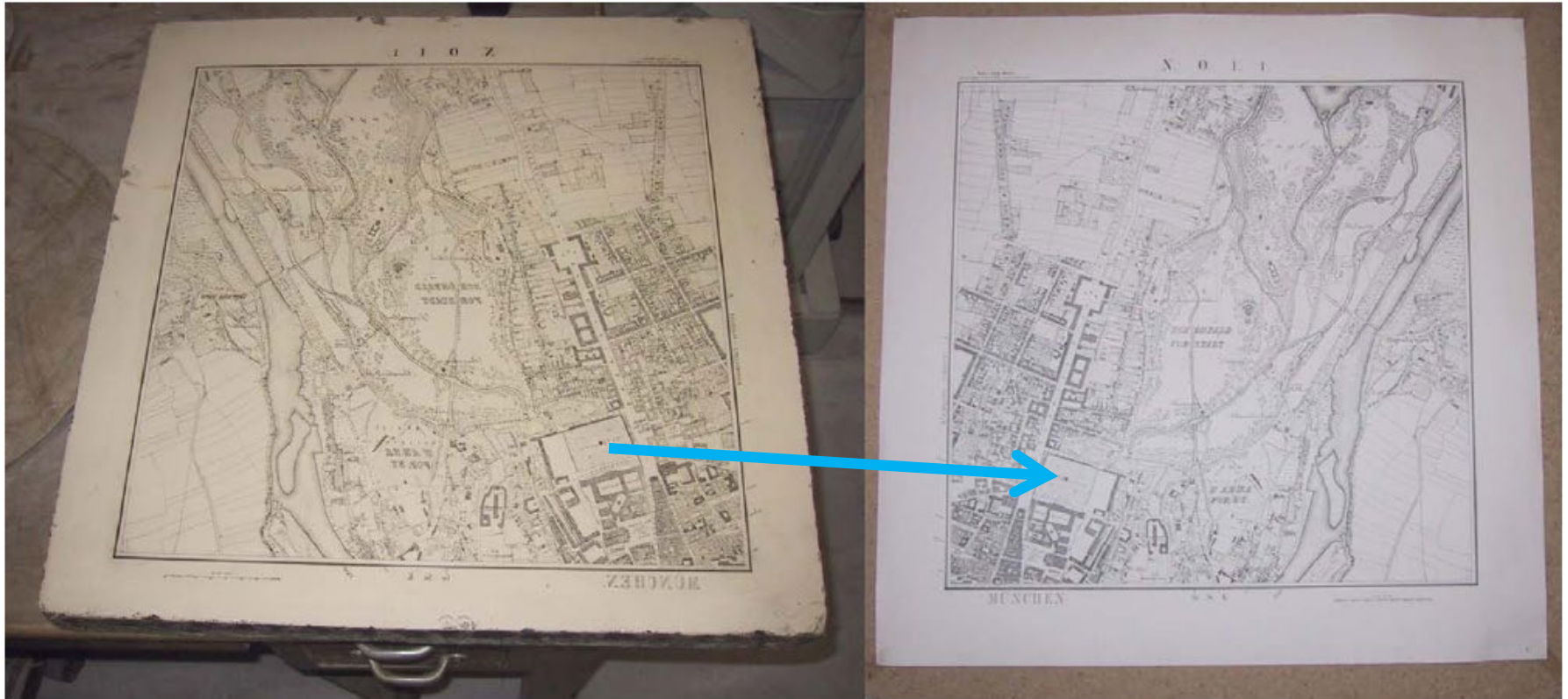


Image source:

[http://www.google.com/imgres?imgurl=http://www.ndiprintmaking.ca/blogimages/9Tonerwashes\\_11B66/DSCN5261.jpg&imgrefurl=http://www.ndiprintmaking.ca/%3Fpaged%3D2&usq=\\_\\_5By6qsjRjYmERcMwV4dNNcxvstY=&h=464&w=557&sz=77&hl=en&start=0&zoom=1&tbnid=Xc9rhtsaF8\\_4jM:&tbnh=136&tbnw=176&prev=/images%3Fq%3Dlaser%2Bprinter%2Btoner%2Bdust%26hl%3Den%26sa%3DX%26biw%3D1202%26bih%3D835%26tbs%3Disch:1%26prmd%3Ddivs&itbs=1&iact=hc&vpx=923&vpy=190&dur=447&hovh=148&how=177&tx=125&ty=100&ei=rvzSTL2HYSoAO7\\_JzBCw&oei=i\\_zSTJ\\_mMobSsAOg0NDbCg&esq=7&page=1&ndsp=23&ved=1t:429,r:4,s:0](http://www.google.com/imgres?imgurl=http://www.ndiprintmaking.ca/blogimages/9Tonerwashes_11B66/DSCN5261.jpg&imgrefurl=http://www.ndiprintmaking.ca/%3Fpaged%3D2&usq=__5By6qsjRjYmERcMwV4dNNcxvstY=&h=464&w=557&sz=77&hl=en&start=0&zoom=1&tbnid=Xc9rhtsaF8_4jM:&tbnh=136&tbnw=176&prev=/images%3Fq%3Dlaser%2Bprinter%2Btoner%2Bdust%26hl%3Den%26sa%3DX%26biw%3D1202%26bih%3D835%26tbs%3Disch:1%26prmd%3Ddivs&itbs=1&iact=hc&vpx=923&vpy=190&dur=447&hovh=148&how=177&tx=125&ty=100&ei=rvzSTL2HYSoAO7_JzBCw&oei=i_zSTJ_mMobSsAOg0NDbCg&esq=7&page=1&ndsp=23&ved=1t:429,r:4,s:0)

# Lithography Process



- ▶ Negative lithography stone of a Munich, Germany map and a positive print
- ▶ Example: <https://www.youtube.com/watch?v=TUXKPI0CPQk>



# From map design software to press h/w

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- ▶ Several intermediate steps in printing a hard copy  
(even if you print directly from your PC to the printer)
- ▶ Page description language (PDF—Portable Document Format, PostScript, PCL—Printer Command Language, or EPS—Encapsulated PostScript)



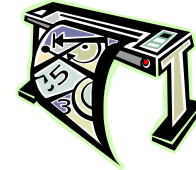
- ▶ Raster Image Processor (RIP)



- ▶ Film negative(s)



- ▶ Positive printing plate



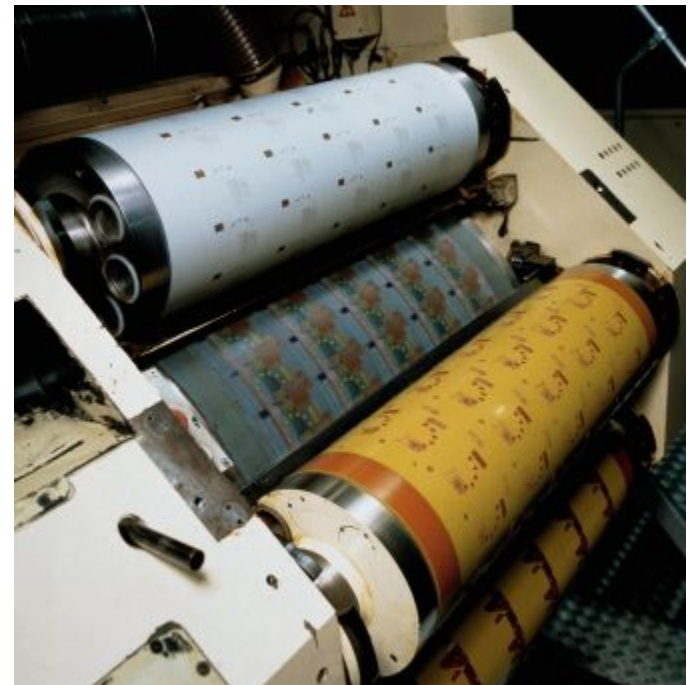
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▶ ([Source: www.diytrade.com](http://www.diytrade.com))

# Print volume

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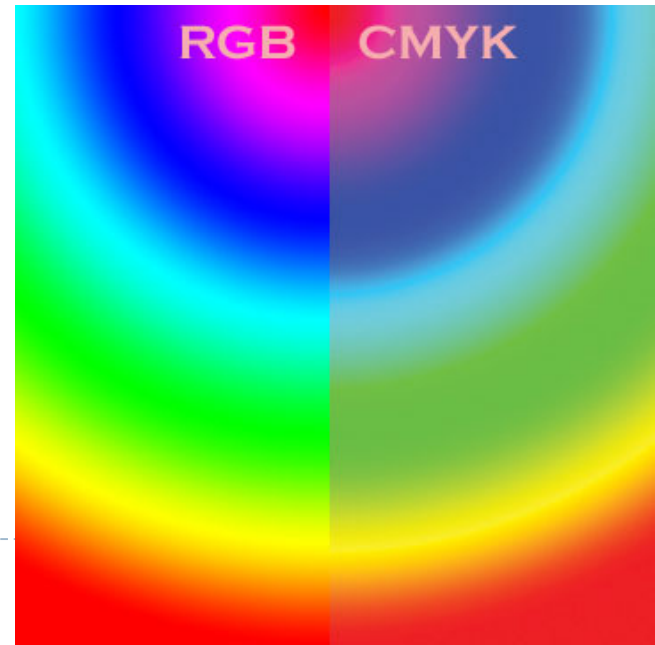
- ▶ Small volumes: color printers (laser, ink jet, copiers)
- ▶ Large volumes: offset-printing
  - ▶ Most common and large scale document printing



# Creating the (digital) *print original*

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- ▶ For printing the original map...
  - ▶ Embed all fonts used in the document
    - ▶ Ex. PDF format
  - ▶ Convert all colors from RGB to CMYK
    - ▶ RGB (scanners, digital cameras...), CMYK (printers, presses...)
  - ▶ Supply a mock-up hard-copy as a guideline
  - ▶ Clearly name/label all documents



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▶ Image source:

[http://www.pulseprint.co.uk/article/rgb\\_vs\\_cmyk\\_basic\\_colour\\_principles/](http://www.pulseprint.co.uk/article/rgb_vs_cmyk_basic_colour_principles/)



# Print-on-demand vs. Offset-printing

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## Print-on-demand

- ▶ Lower quality (esp. color)
- ▶ Uniform unit cost at all quantities
- ▶ Limited flexibility in cut size and paper
- ▶ Low - No storage cost
- ▶ Low distribution cost
- ▶ Low initial investment
- ▶ Low prepress cost, errors easily corrected

## Offset-printing

- ▶ High quality
- ▶ Low unit cost for large quantity
- ▶ Tremendous flexibility in cut size, paper weight and color
- ▶ High storage cost
- ▶ High distribution cost
- ▶ High prepress cost, errors extremely expensive

One study about book printing (<http://www.fonerbooks.com/pod.htm>) showed a break even at 750 units

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# USGS Map-on-demand (MOD)



## U.S. Geological Survey Maps Price List

This list includes maps sold by the U.S. Geological Survey (USGS). Indexes are available for some map series.

Many of these maps can also be purchased from a USGS Business Partner. Refer to your local phone book's yellow pages for commercial map dealers to contact them directly for pricing and ordering information.

**The USGS Maps and Books order form accompanies this price list.**

To order by mail, send order form and payment to:

USGS Information Services  
Box 25286  
Denver, CO 80225

Maps can be purchased at many Science Information and Library Services Offices (SILS).

To order by fax, call 303-202-4693 and transmit order form or order through the USGS Store at <http://store.usgs.gov>.

For information or ordering assistance, call 1-888-ASK-USGS.

Map Name and Scale	Price (per sheet)
<b>Primary Series Topographic Quadrangle Maps</b>	<b>\$6.00</b>
Standard Topographic Quadrangles (7.5 minute 1:24,000, 1:25,000, 1:20,000; 7.5 x 15 minute 1:25,000; 1:63,360)	
<b>Topographic, Image, and Related Maps</b>	<b>\$7.00</b>
County Maps (1:50,000 and 1:100,000)	
<div></div>	
<b>Earthquake Maps</b> (Refer to the Earthquake Maps price list for the most recent prices and products.)	<b>Varies</b>
<b>National Imagery and Mapping Agency (NIMA) Topographic Maps, Publications and Digital Products</b> (Refer to the NIMA price list for the most recent prices and products.)	<b>Varies</b>
<b>Historical Maps</b>	<b>\$12.00</b>
<b>USGS Map-on-Demand Printing</b> (Rarely requested maps.)	<b>\$20.00</b>

# Summary

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- ▶ Copyright/liability
- ▶ Proofread maps
  - ▶ Design working?
  - ▶ Omissions/commissions?
  - ▶ Errors, typos?
- ▶ Final production step affects design choices
  - ▶ Color
  - ▶ Screening
  - ▶ Printing



# With Map Reproduction in Mind...

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- ▶ Readings

- ▶ Ch. 13&21

- ▶ PM2 due today

- ▶ Mapping Project begins on 12/4

- ▶ Creating your own digital map with a good knowledge of mapping and GIS S/W & data
  - ▶ Instruction & data will be provided on the BeachBoard

