

GEOL 452/552

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GIS for Geoscientists I

Lecture 5 - chapter 2

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Today

- HW I graded
- Review of last lectures (voting cards)
- Finish symbolization: graduated symbols and charts
- Look at classification methods (how to set bounds?)
- labels (dynamic vs. manual)
- Reminder: lecture feedback (counts towards class participation, need at least 5 during the semester)
- Tip: see MAPPING reference part in textbook: p. 522

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Schedule

Abbreviations: ch = chapter, rg = review questions, ex = exercise, tut = tutorial, HW = homework, p =

Date	Chapter	Lecture (1hr)	Practical Part (1 hr) + Homework
23-Aug	Syllabus etc.	Syllabus, course overview, computer network/file-server setup, Blackboard	Google Earth intro, ch 1 rg 1,2,5 (HW0: make placemaker Google Earth file)
25-Aug	Ch 1 - GIS Data	GIS data layers, GIS example	Ch 1 tut 1-44
30-Aug		scale, coord sys, raster, ArcView/INFO, types of files	HW: 1,4,5 + 6
1-Sep	Ch 2 - Mapping GIS data	scale (ch1), data types ArcMap: data frames, symbolization, normalization	start: ch 2 tut 1 - 40
6-Sep		symbolization, classification,	finish ch 2 tut 1-40, HW 2 ch 2 ex 2-7 + 8 (see Bb - has changes!)
8-Sep		(leftovers) raster display	(optional: tut. 41-57 (raster symbolization))
13-Sep	Ch 3 - Presenting GIS Data	map layout design, scale bars, text, labeling	ch 3 tut 1-48
15-Sep		Mini project 1 (census data) (= HW3)	work on mini proj. 1

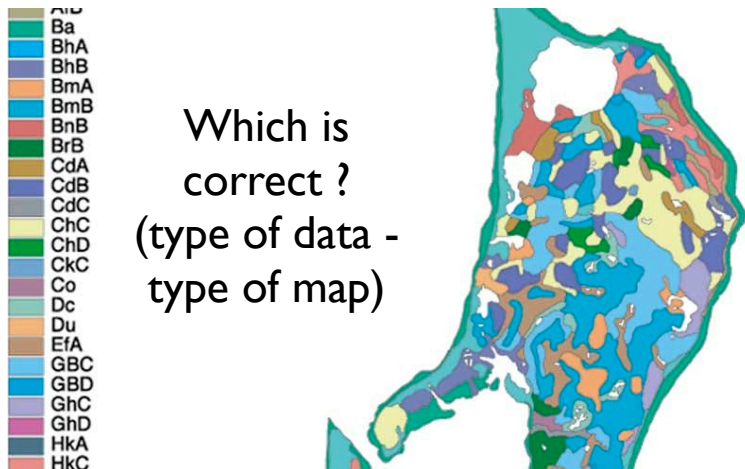
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Review (ch 1 + ch2)

- What is georeferenced Data?
- what is vector data ?
- what is a feature ?
- what is a feature class ?
- what are layers ?
- what are records?

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- When opening a mxd file (ArcMap document), a red ! besides a layer means
- What best describes a ArcGIS map document (.mxd file)?

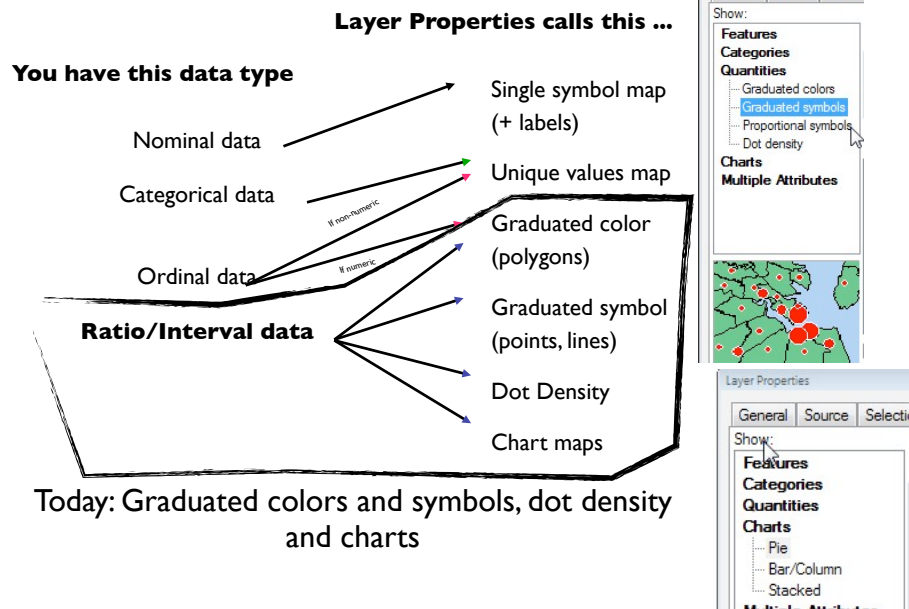


Which is correct?
(type of data - type of map)

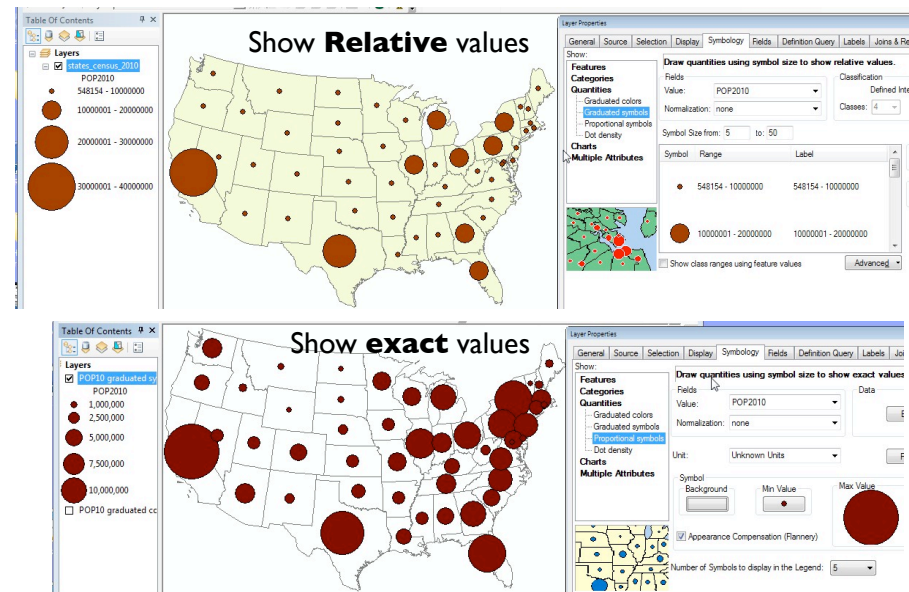
Follow along

- copy this folder and run mxd file inside:
GEOL552\data\follow along data\ch2_class_ex
- census data is in mgisdata\Usa\usdata\states (may need to re-link layers)
- look at 2010 population data per **state** (POP10)
- (my slides will show POP2000)
- try different types of symbolizations and data classification as I go over them
- want to keep a symbolization?
 - In Table-of-Content: 1) Right-click on layer - Copy
 - 2) on data frame (!) Right-click - Paste
- save mxd file after lecture
- mini project I will deal with coloring/symbolization of census data by county

Mapping GIS data in ArcMap Part 2

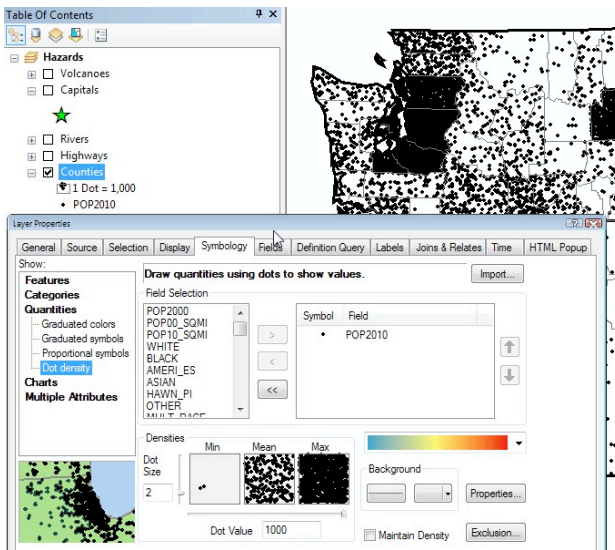


Graduated symbols

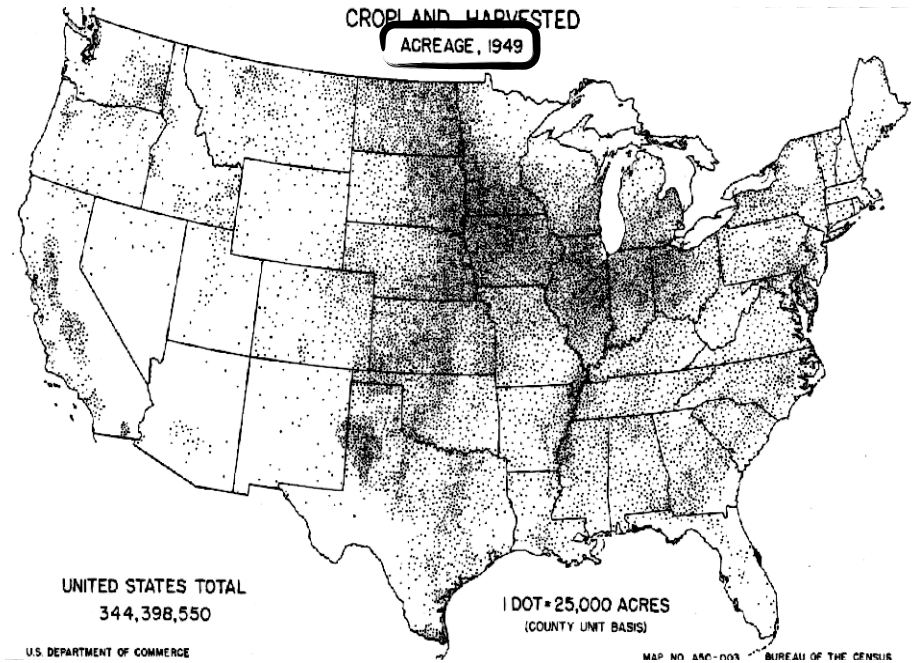


Dot density

- Uses artistic “dotting” effect (shading)
- Dot “density” conveys value
- Dot placement is not precise, only artistic!
- Good for general visual impact
- traditional visualization technique, does not need transparency for printing



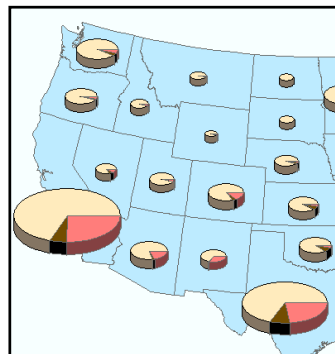
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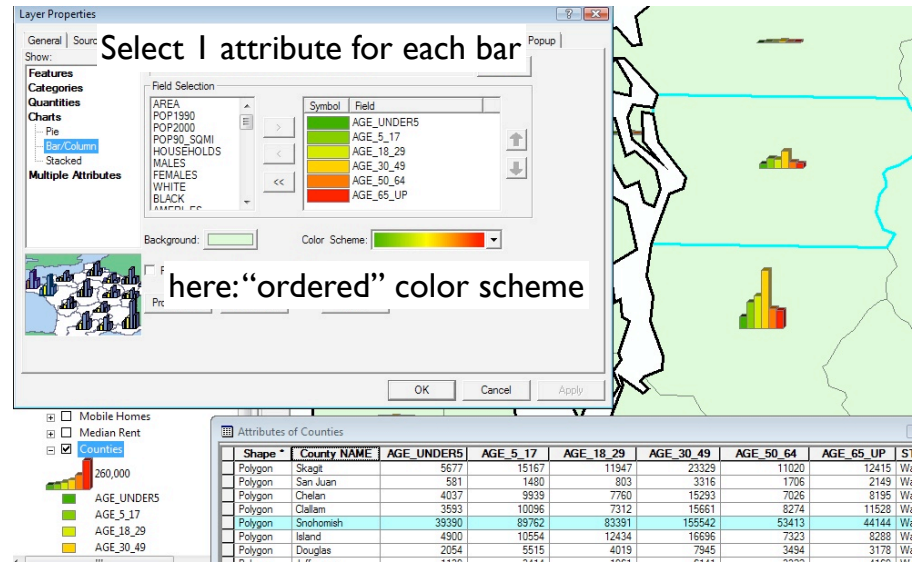
Chart maps

- Symbol (pie, bar) showing **several** attributes at once
- Good for showing distributions and proportions
- Pie chart:
 - color + slice size for race distribution (3 attributes)
 - Pie size for absolute number of people
- Shape (states) used only for locations



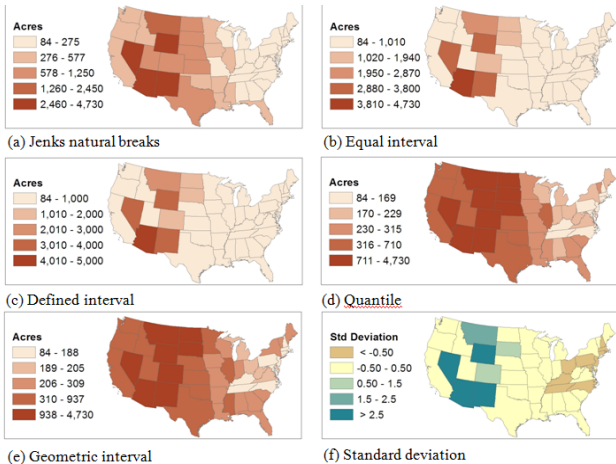
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Bar Charts (histogram)



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Classification



- same data, all use Graduated colors - same color ramps ... but create very different looking visualizations!
- The Type of classification creates different **Breaks**
- Breaks determine:
 - width of each class
 - number of classes
 - (the number of breaks is 5 for all classifications here)

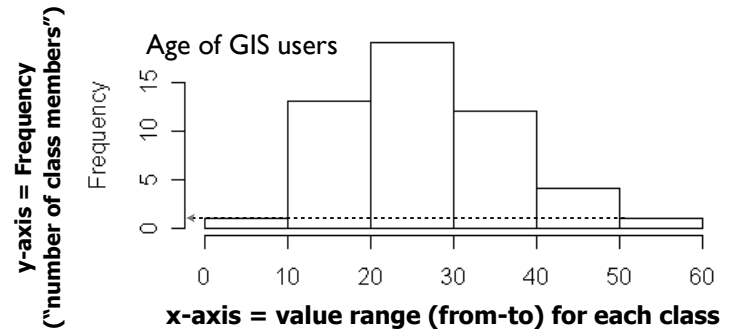
(this shows Acres, not POP2010 ...)

Data classification of numerical data: histogram

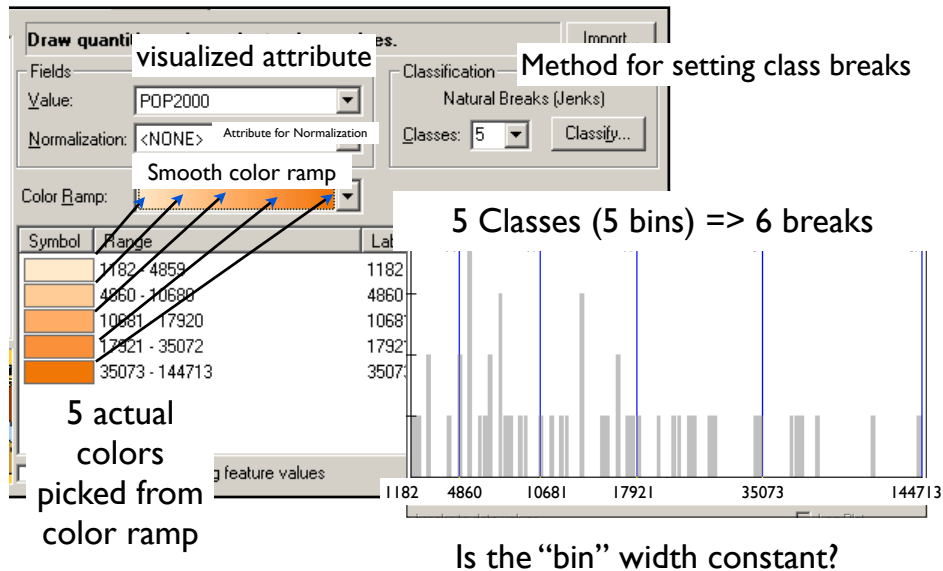
given: a set of numbers (ages): 34, 9, 52, 34, 45, 32, ...

Frequency: number of "hits" for each class (**bin**, interval):

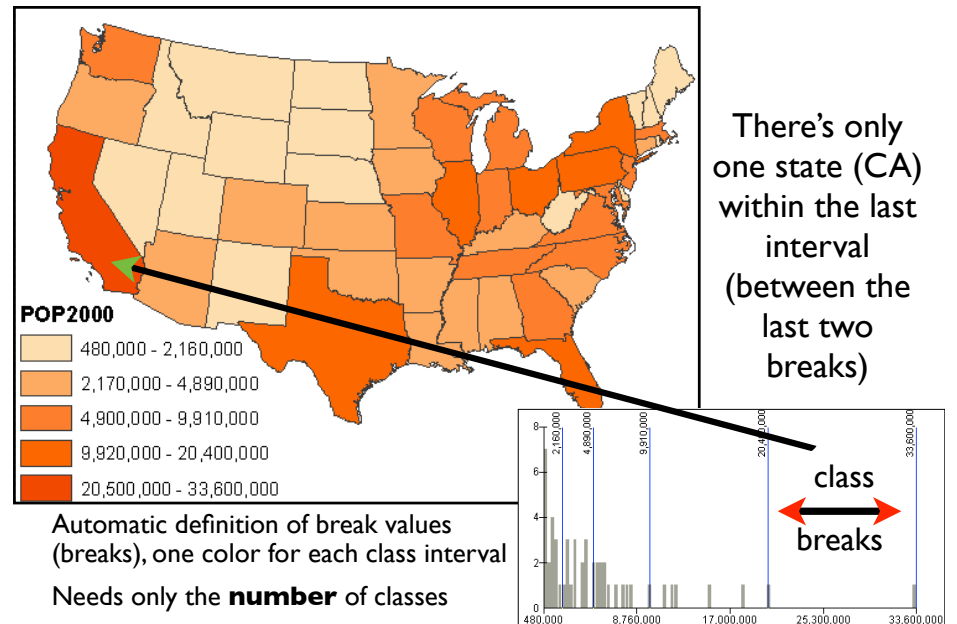
- how many classes are here?
- how "wide" is each class?
- What are the class boundaries (breaks) here?
- how many numbers fall into (are counted by) the last class?



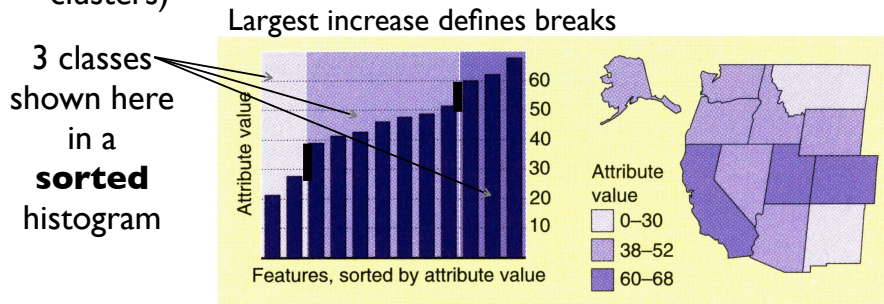
Classifying a graduated color maps



Jenks Natural Breaks

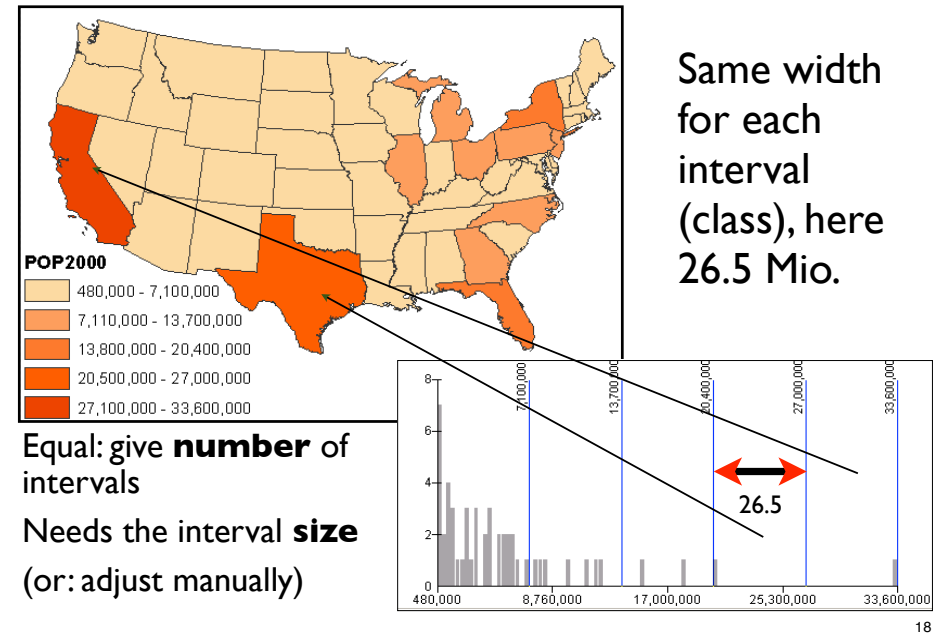


- How does this automatic calculation of breaks work?
- Looks at how to best **cluster the data**
- Number of classes to make is given (here: 3)
- Finds discontinuities (“jumps”) in sorted data
- Good to isolate and visualize clusters of classes
- Difficult to compare with other data (will have other clusters)



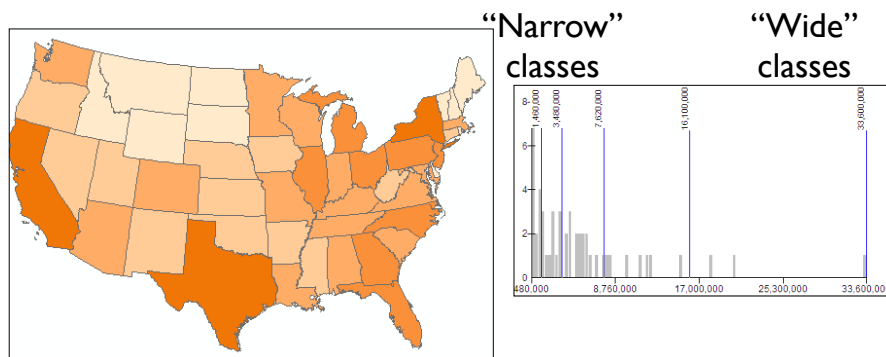
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Equal/Defines Interval (Class)



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Geometrical Intervals



Starts with a class width (leftmost)

Multiplies each succeeding class boundary by a constant

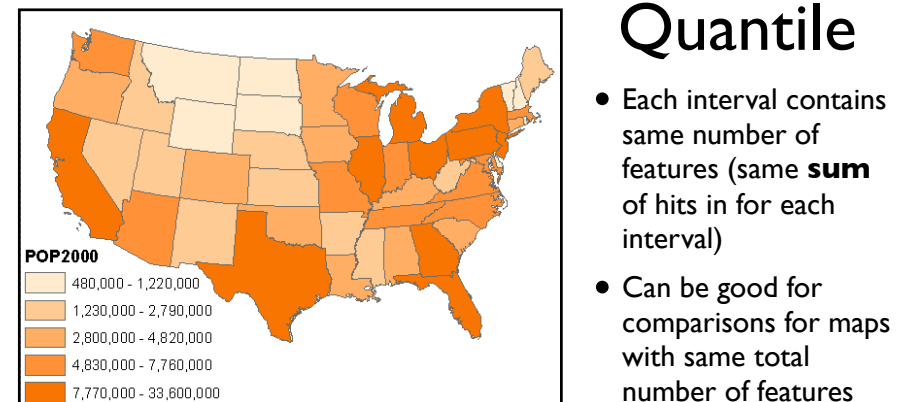
Effect: classes become “wider”

Assumes: many low numbers, few high numbers

Works well for normal and skewed distributions

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Quantile

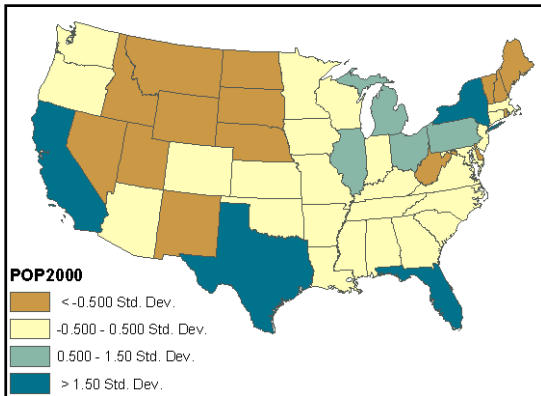


- Each interval contains same number of features (same **sum** of hits in for each interval)
- Can be good for comparisons for maps with same total number of features

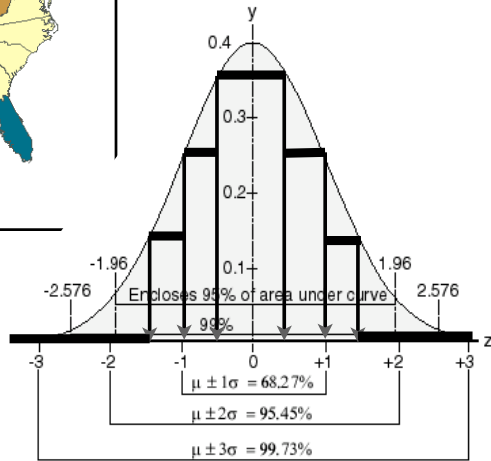
If you mentally stack (add) all bins with each class on top of each other then all stack’s would have the same height.

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Standard Deviation



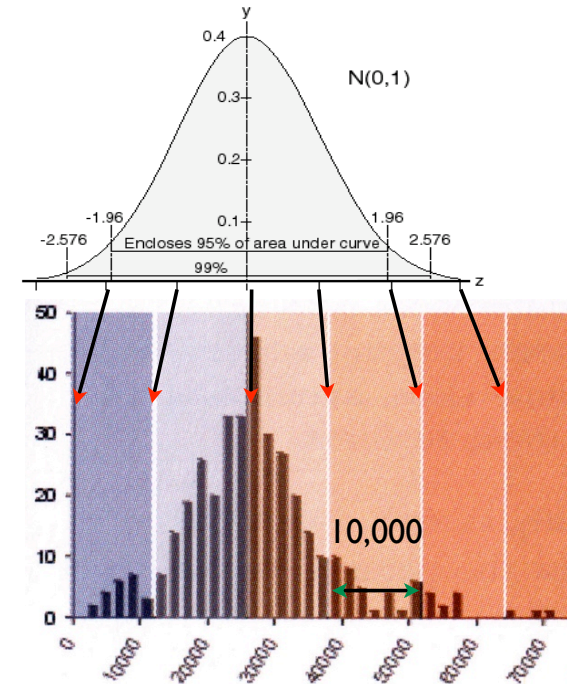
- Shows deviation from mean
- Based chunks on “sigma” values
- User chooses chunk size e.g. 0.5 sigmas (standard deviation units)
- Assumes data are normally distributed (is it?)



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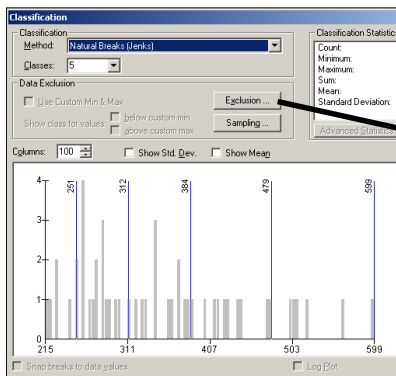
Standard deviation

- Good for comparing above/below average
- Color scheme “folded” around mean (what’s the mean here?)
- Needs good estimate (“stable” mean)



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Excluding data from classification



Exclude numbers that mean “No data was collected” (here: -99)

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Questions? Lab

- Lab: Tutorial ch 2 - up to step 40
- HW2: ch. 2 ex 2-7 + 8
- make sure to read the HW2 instructions on Blackboard first!
- If needed (how do I ...?) : consult textbook MAPPING reference part (pp. 522 -)

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