SYMBOLISATION

Generalisation:
which / how many features we display..

Symbolisation:
how to display them?

General Goal:

"easy and effective communication"

– based on design principles and common sense as much as rules

Similar principles in traffic signs
Effective easy communication

www.doodlesandjots.com

Symbolisation (shapes)

Road sign in Belorussia (next to historic church)

Symbols: Visual Design Variables

Shape: the detail or outline of a point symbol

Pattern: regular repetition of shapes

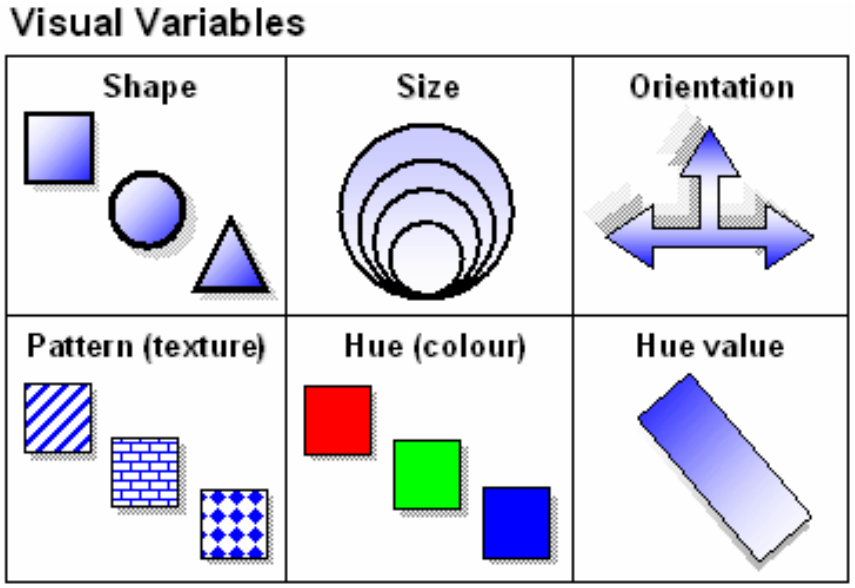
Texture: *variation of tones or lines*

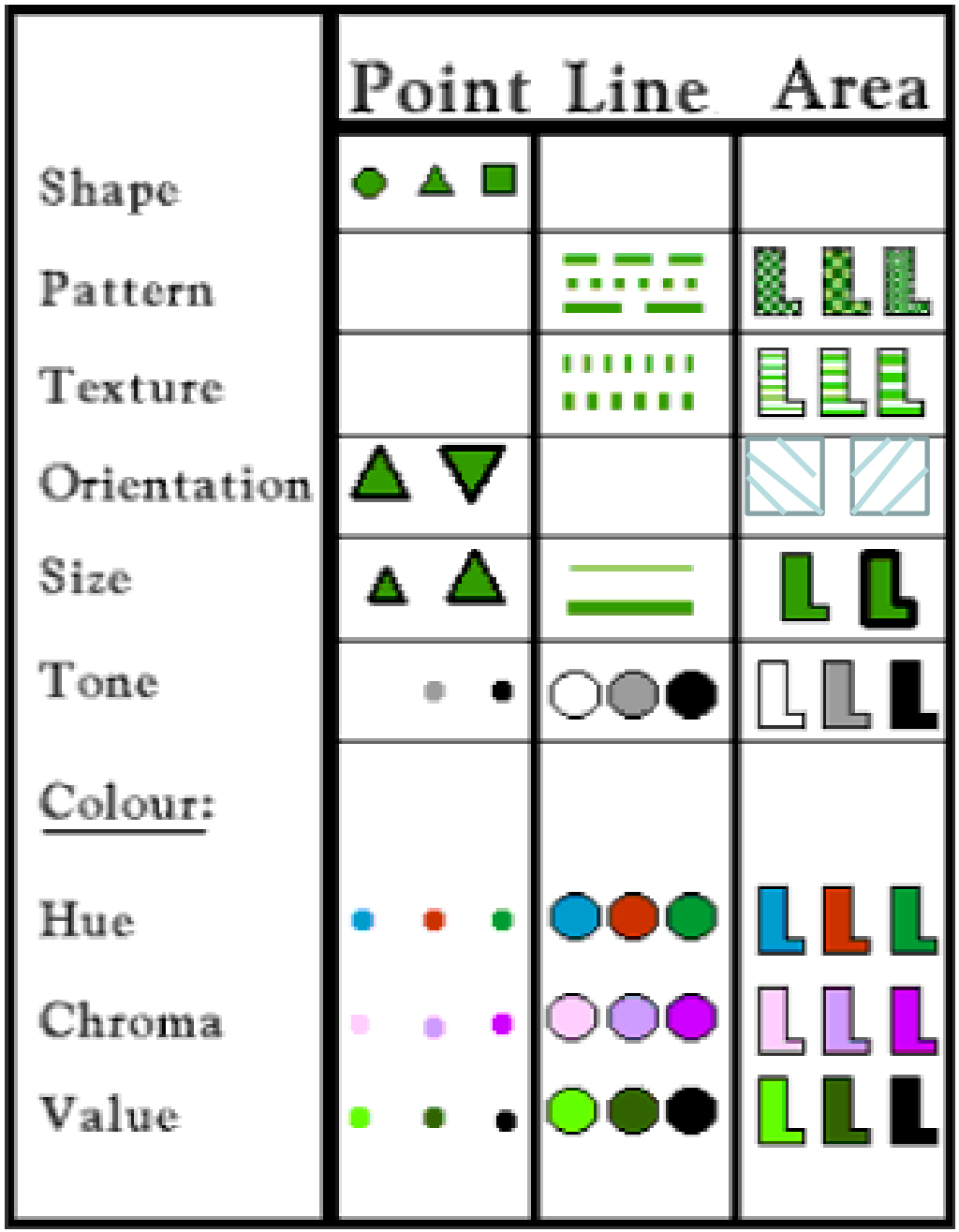
Orientation: *direction of symbol element*

Size: size of a point, width of a line

Tone: shades of gray (% black)

Colour: hue, chroma and value





Weak variable

Very weak

Strongest variable

Visual Design Variables

Colour: has three 'dimensions'

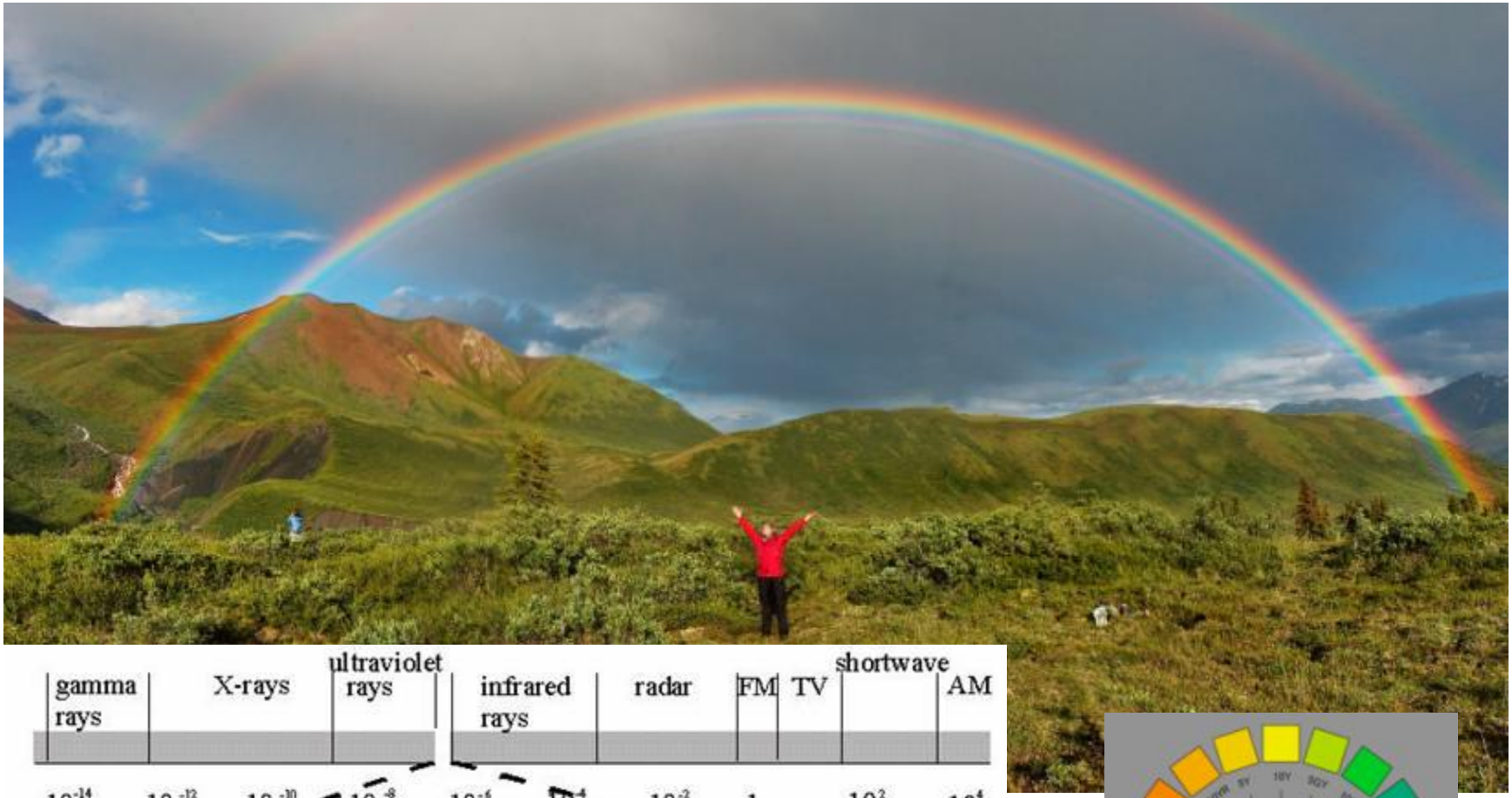
hue (wavelength): "the visual sensations from different wavelengths of light " e.g. red, blue

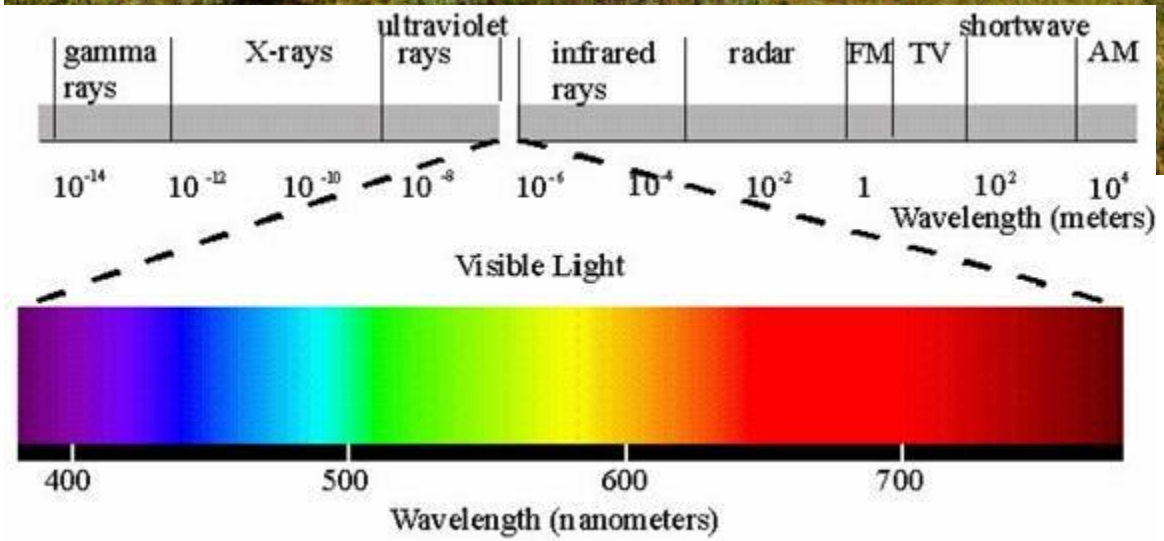
chroma (saturation): saturation or intensity = tints,
e.g. pale v solid blue

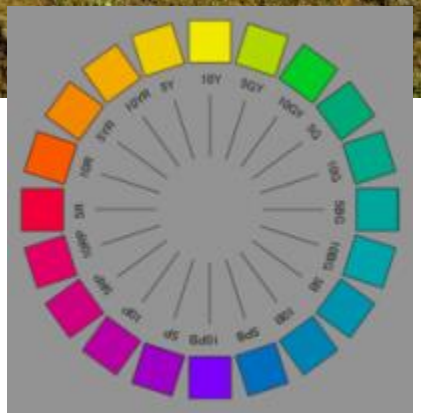
value (intensity): lightness or darkness = shades,
e.g. blue v blue/black

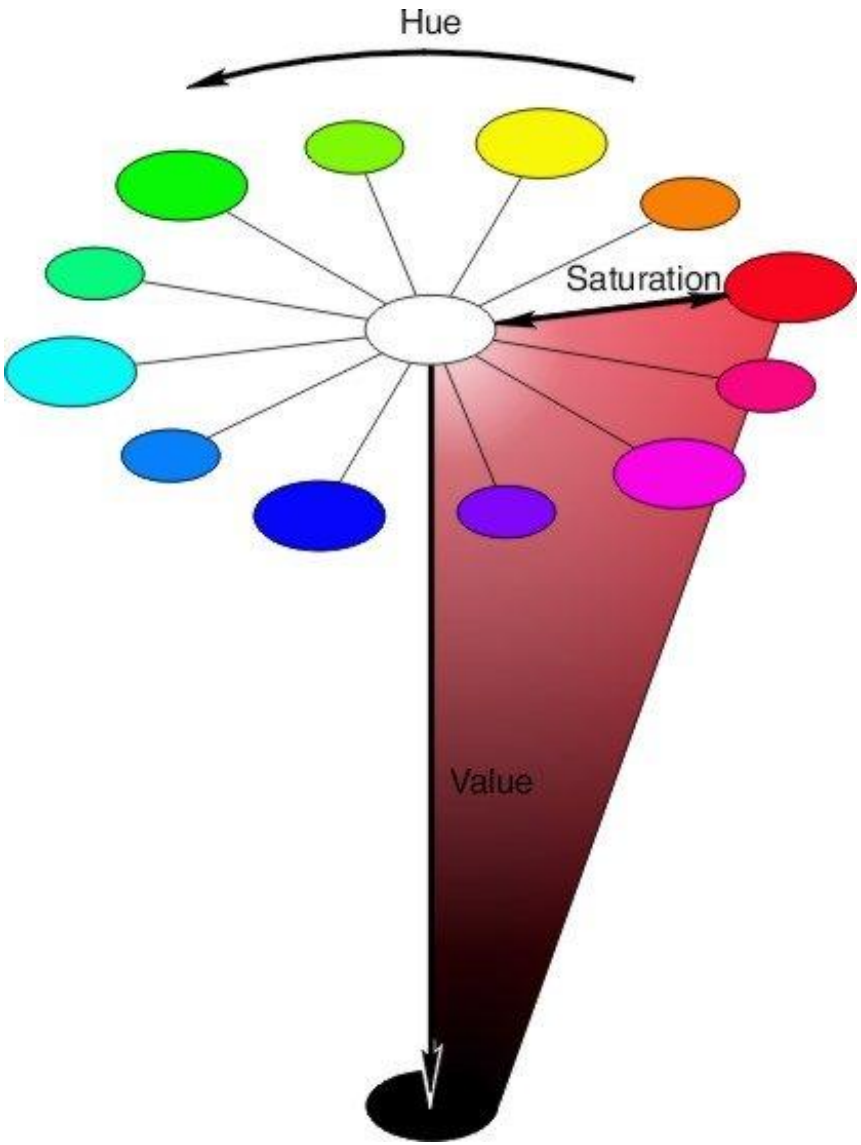
The 'electro-magnetic' colour spectrum

the longest wavelengths of light (red) are the least refracted







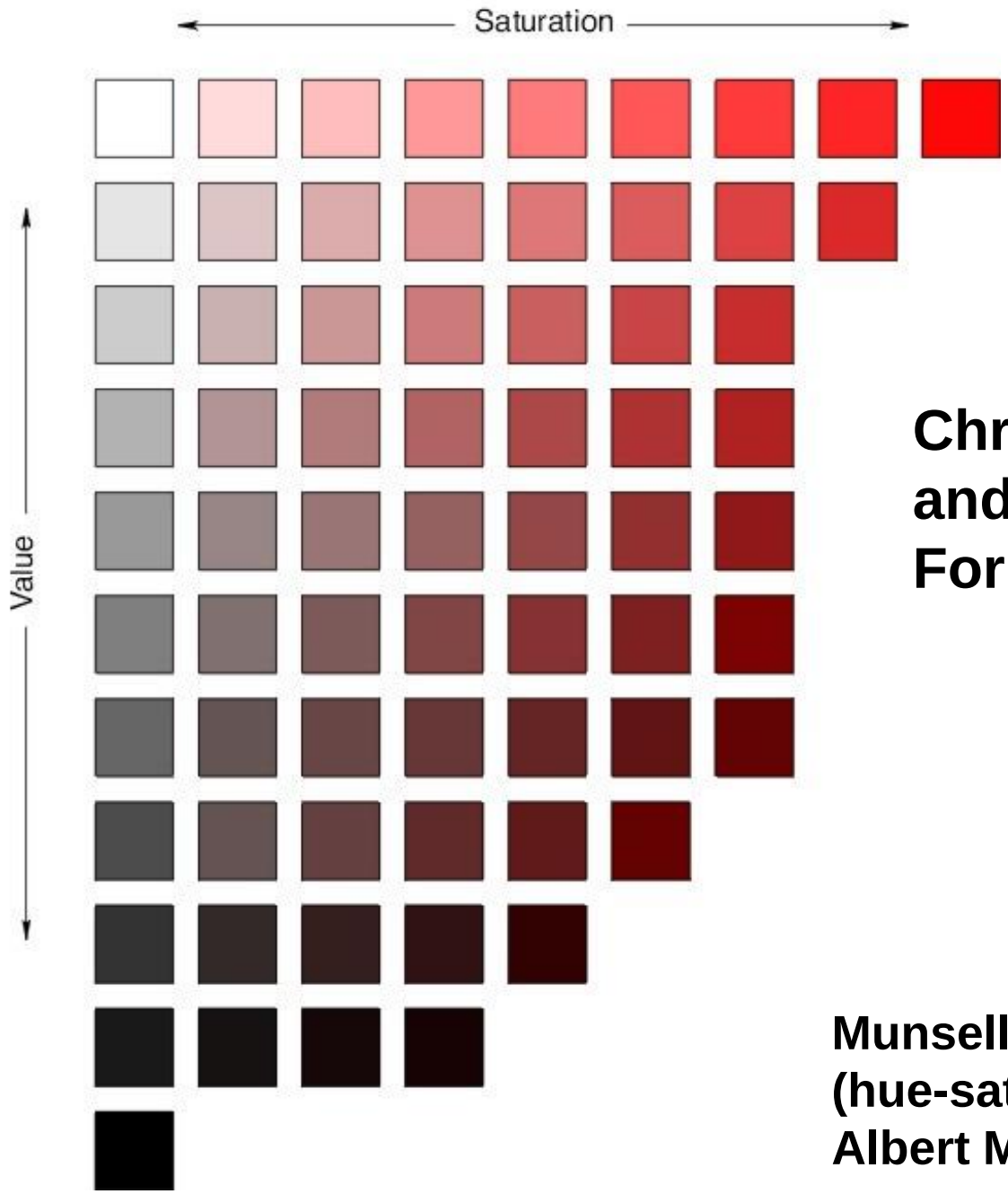


hue - basic visible colour,
e.g. 12 step wheel (RGB mix)

Chroma - a colour's intensity or saturation.

value – relative lightness - darkness. Can be hard to see variations in value

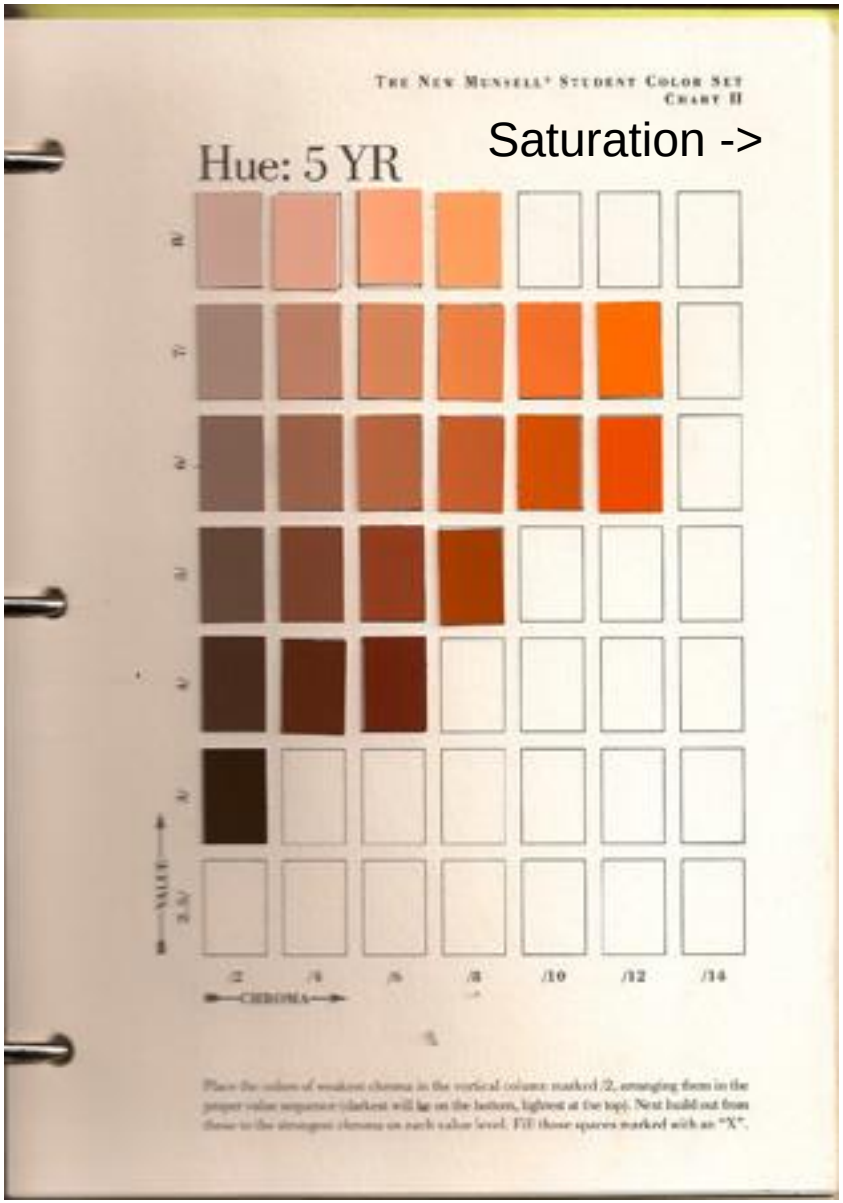
https://htmlcolorcodes.com/color-picker/



Chroma / saturation and value / intensity For one hue (red)

Munsell soils color chart (hue-saturation-intensity) Albert Munsell, 1858 - 1918

Munsell color chart (hue-saturation-intensity) for soils - also used for beers



Color based on Standard Reference

SRM/Lovibond	Example	Beer color	EBC
2	Pale lager		4
3	German Pilsener		6
4	Pilsner Urquell		8
6			12
8	Weissbier		16
10	Bass pale ale		20
13			26
17	Dark lager		33
20			39
24			47
29	Porter		57
35	Stout		69
40			79
70	Imperial stout		138

Design criteria: 1. 'Association'

Symbols should be 'associated' with their features, physically or by function

Vegetation  green

Contours  brown
(except on ice …)

Battlefield 

Winter sports 

Camping 

Railway line 

Taking association too far ?

One man's campaign to make football (soccer) signs more realistic :

… missing the point of generalization/symbolisation

Point symbols

Are mostly based on Shape
And also colour

Solid or open ?

Letters are not used much

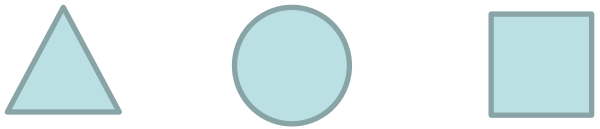
- can be confused with place names except:

H Hospital

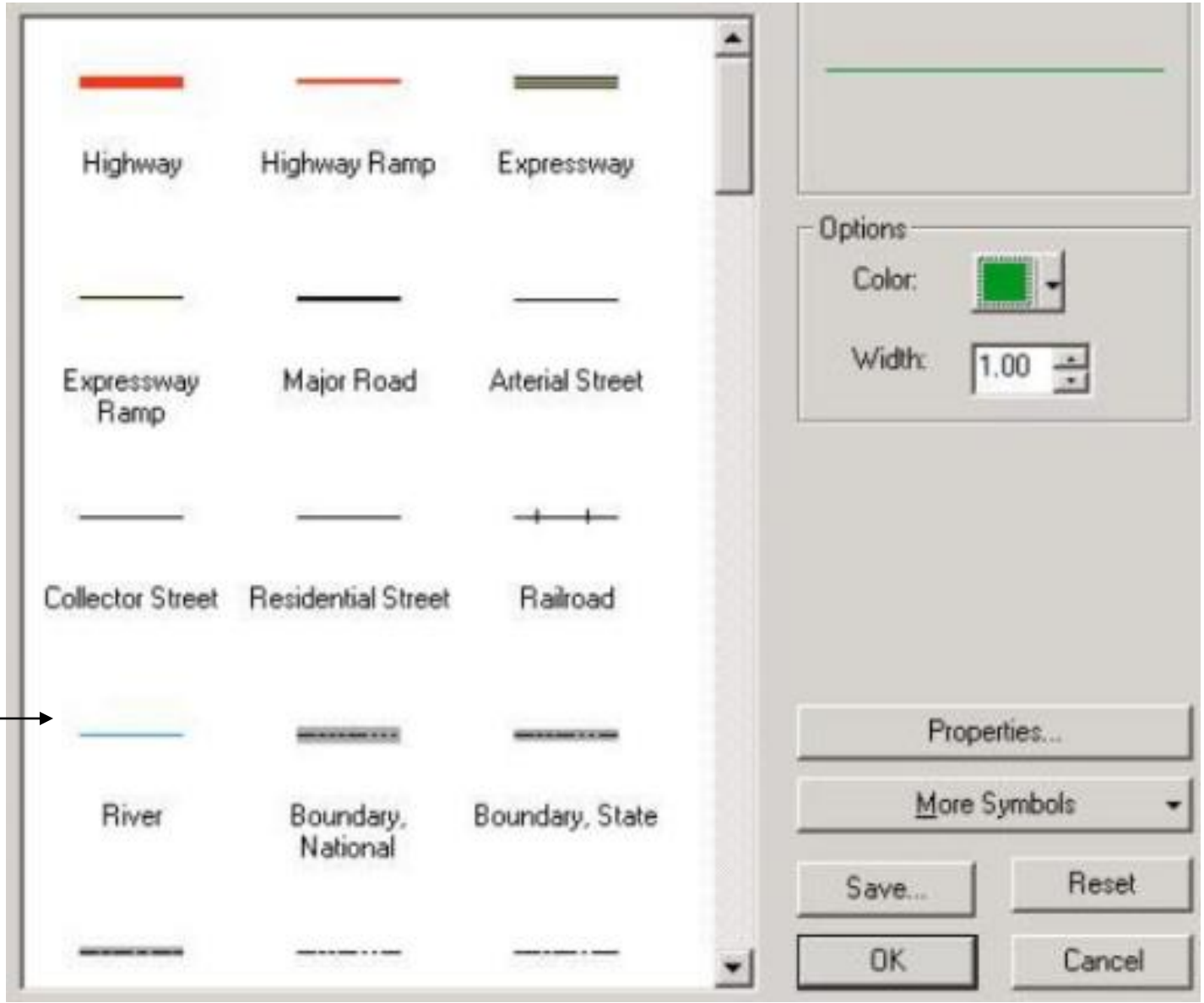
P Parking

i Information (or I ?)

'Abstract': if space is limited



Association - Lines



Too big for most streams →

Beware of defaults !

Association - Lines

- **'permanent' physical** features are shown as solid.

  e.g. rivers, roads

- Less certain features are shown in **broken** lines.

  e.g. intermittent streams, trails

- Administrative boundaries use a **dot-dash** pattern

Areas (polygons) – output design

Fill – colour, pattern

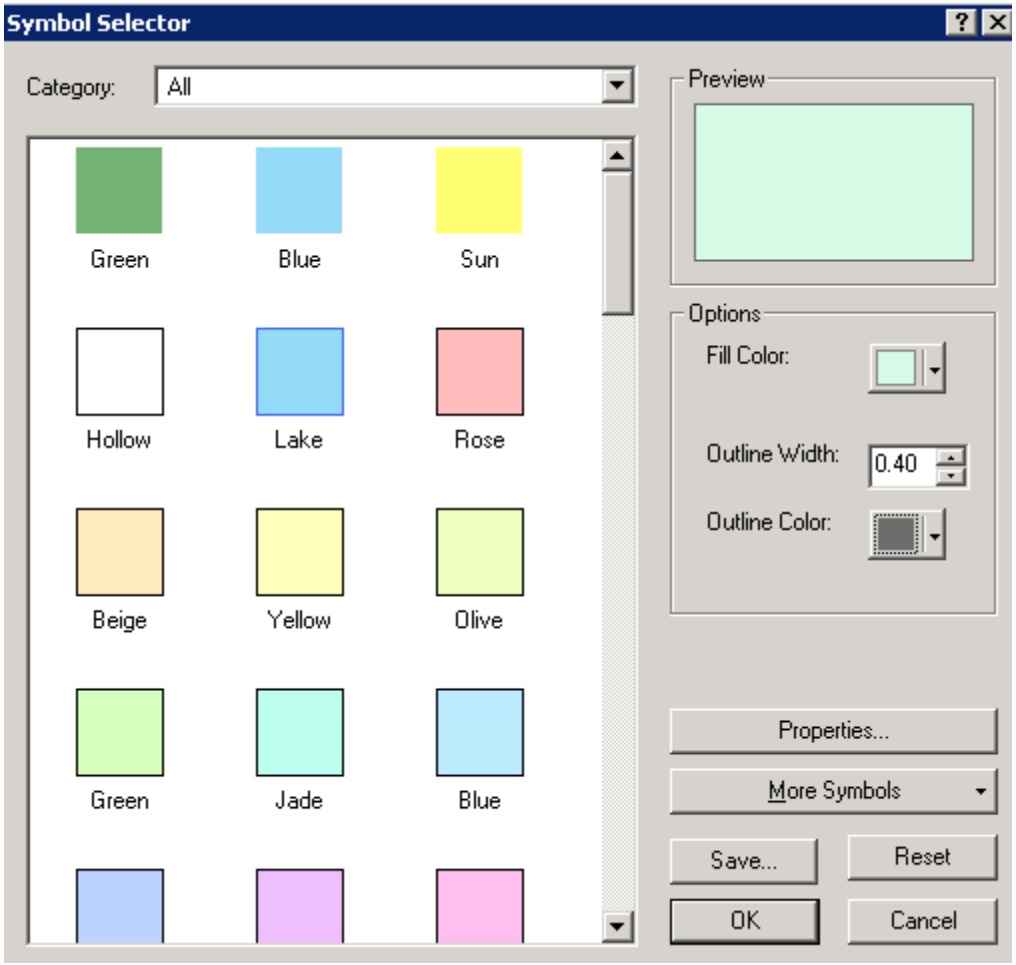
Colours should be associative

Avoid really solid colours

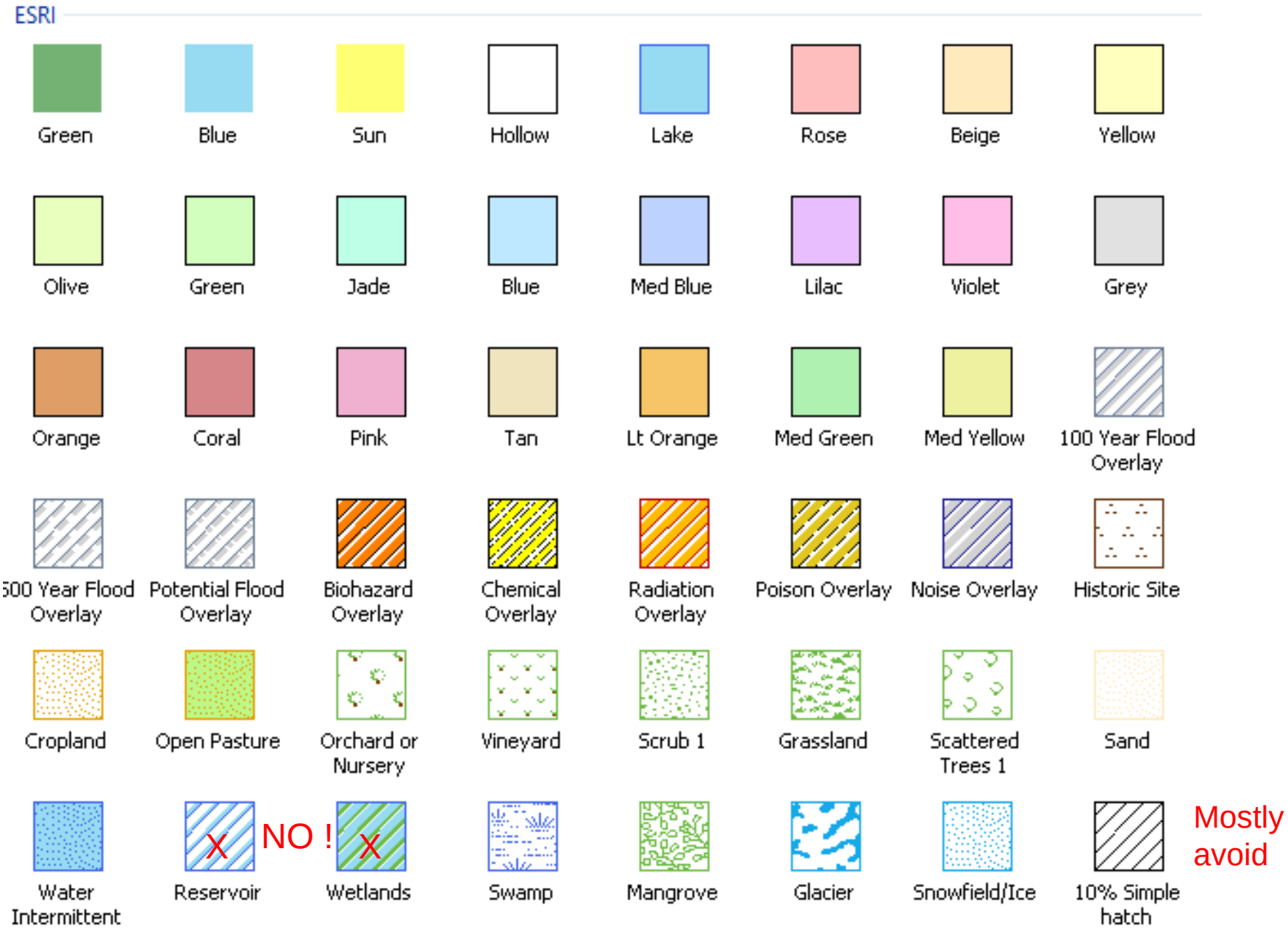
(except for small areas)

Outline ? – colour, width

- No polygon outline for 'uncertain' boundaries

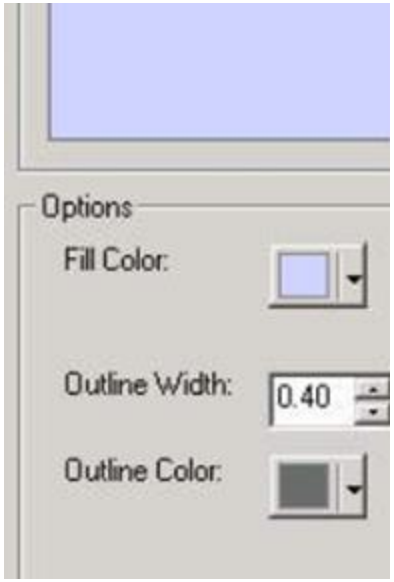


More OK and ugly Esri polygon patterns – don't copy defaults …



More notes on polygons / areas

Use of fill vs outline vs both depends on:
meaning / significance of area edge



Rivers and lakes: outline (+ colour fill)

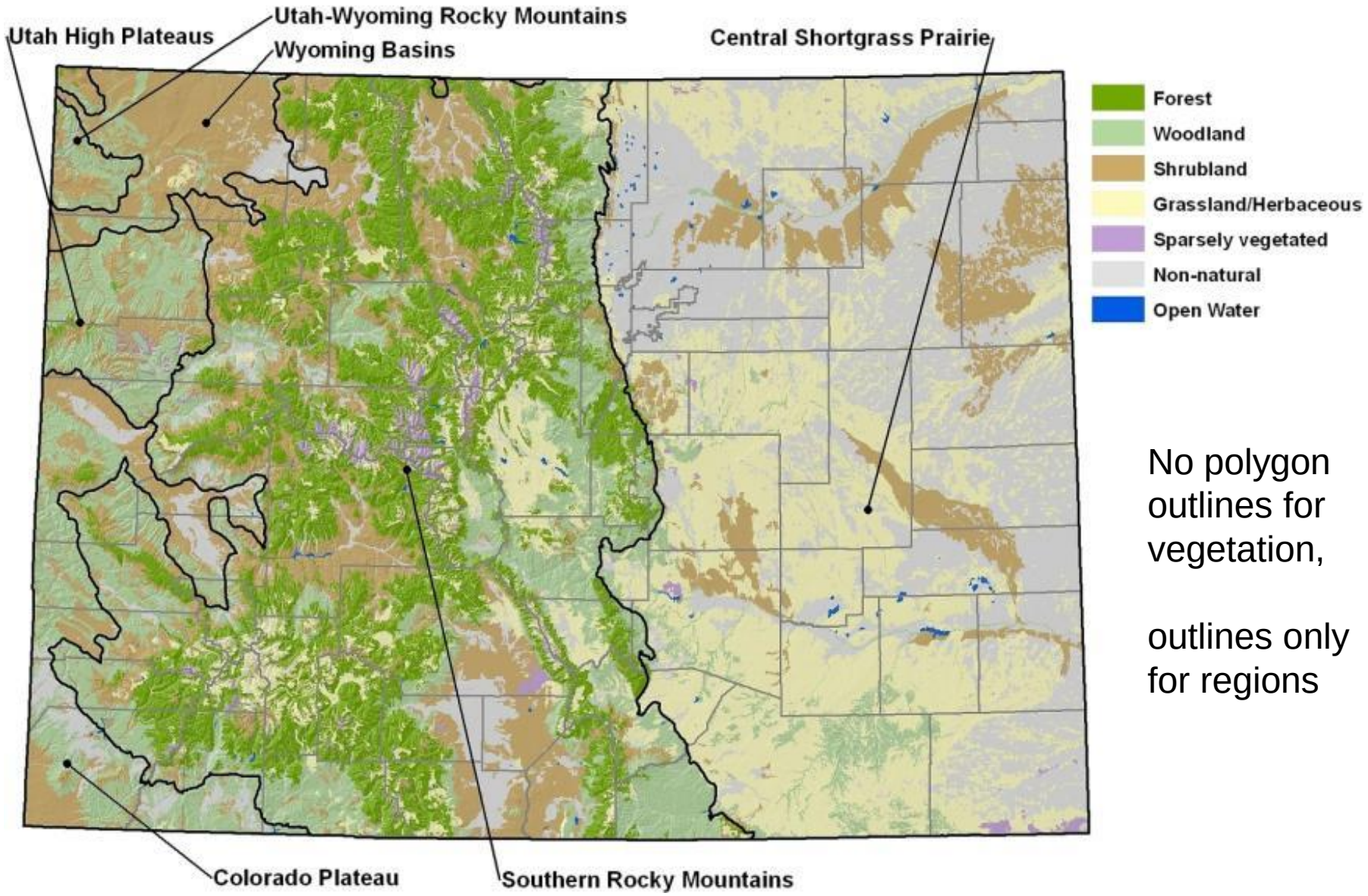
Park boundary: outline / no fill ?

Forest /vegetation: fill only (no outline)

Size: small area - fill (+outline) maybe solid colours

large areas - outline only, light colours only

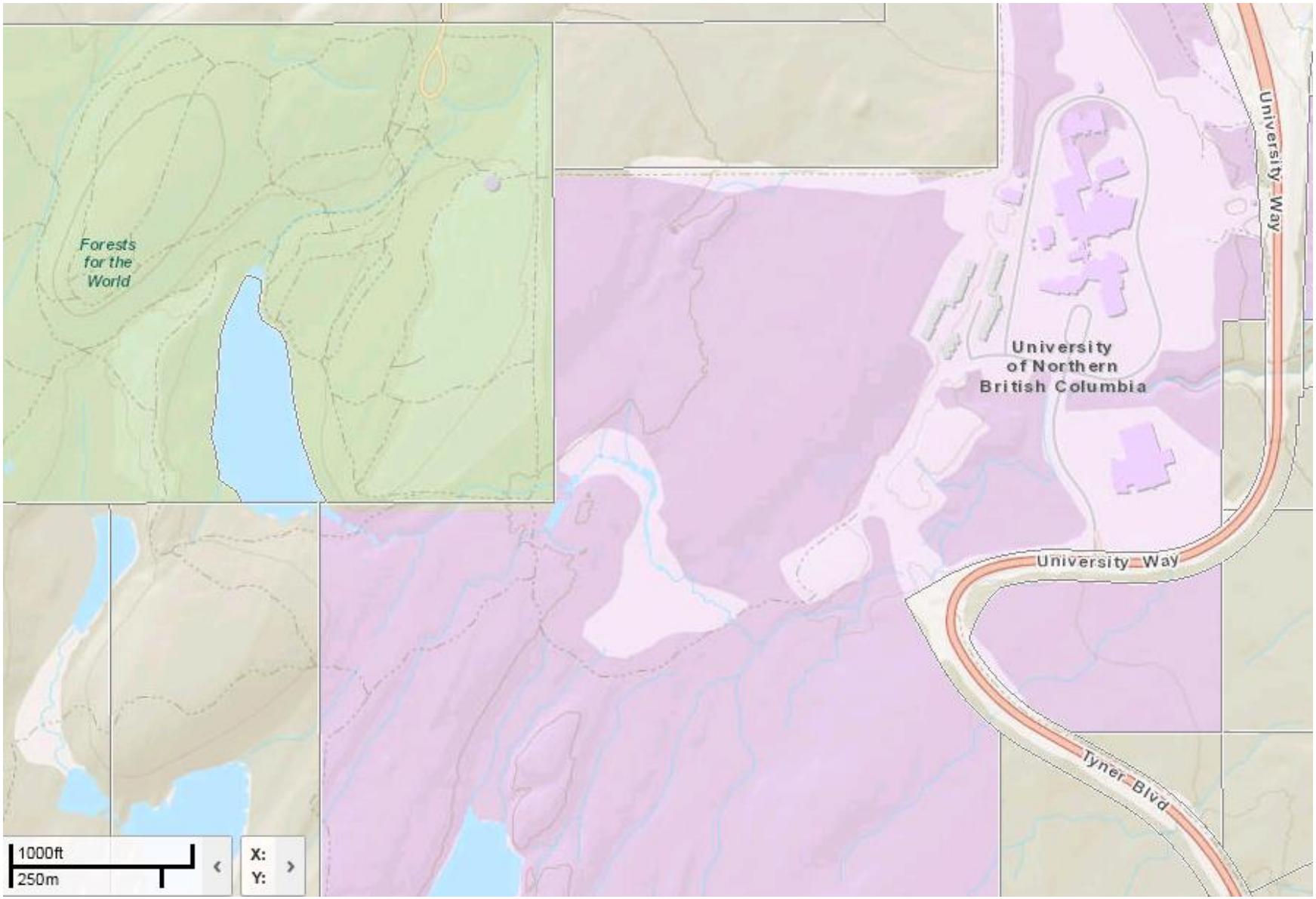
Example 1



No polygon outlines for vegetation,

outlines only for regions

Example 2: PGmap – use of area transparency – but outline only might be better



Boundaries are not marked – no signs or fences

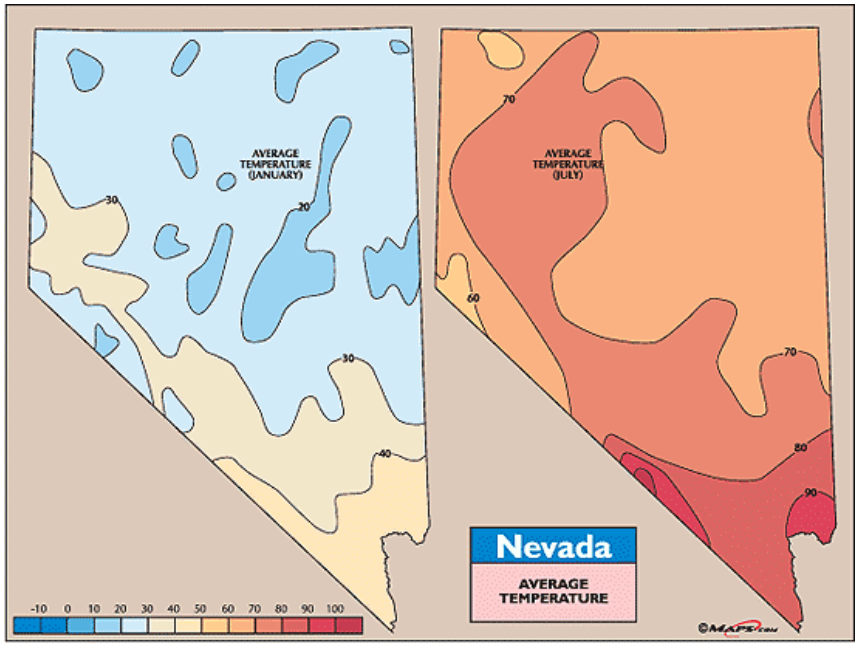
Colour associations: physical and psychological

Yellow – sun, bright (cheery..) ;

Blue – water, calm, cool etc..

Red – heat, danger, blood ?

Green – vegetation, parks, recycling ?



http://visual.ly/meaning-colour-marketing

Association – size

larger / more important features e.g. road width

Association Conventional symbols –
e.g. topographic mapping

Canada NTS conventions

Green – forest vegetation

Red – main roads

Orange - minor roads

Black – buildings

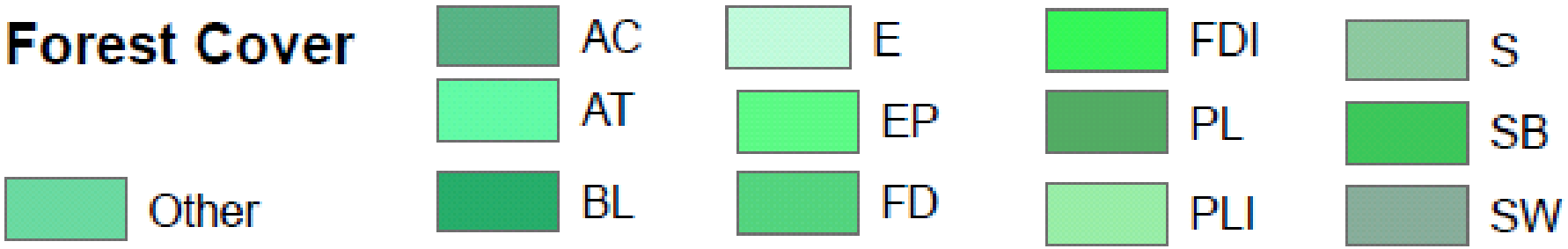
Urban – pink

most conventions are based on association e.g. blue for water, while others are less obvious, e.g. pink / orange for urban.

Association taken too far - ensure good contrast
Too similar for the human eye

Example: unsuccessful forest classification (primary species)

colours: too many similar tints/shades of the same hue



2. Qualitative versus quantitative
- 'data association'

Qualitative: [nominal / categorical]

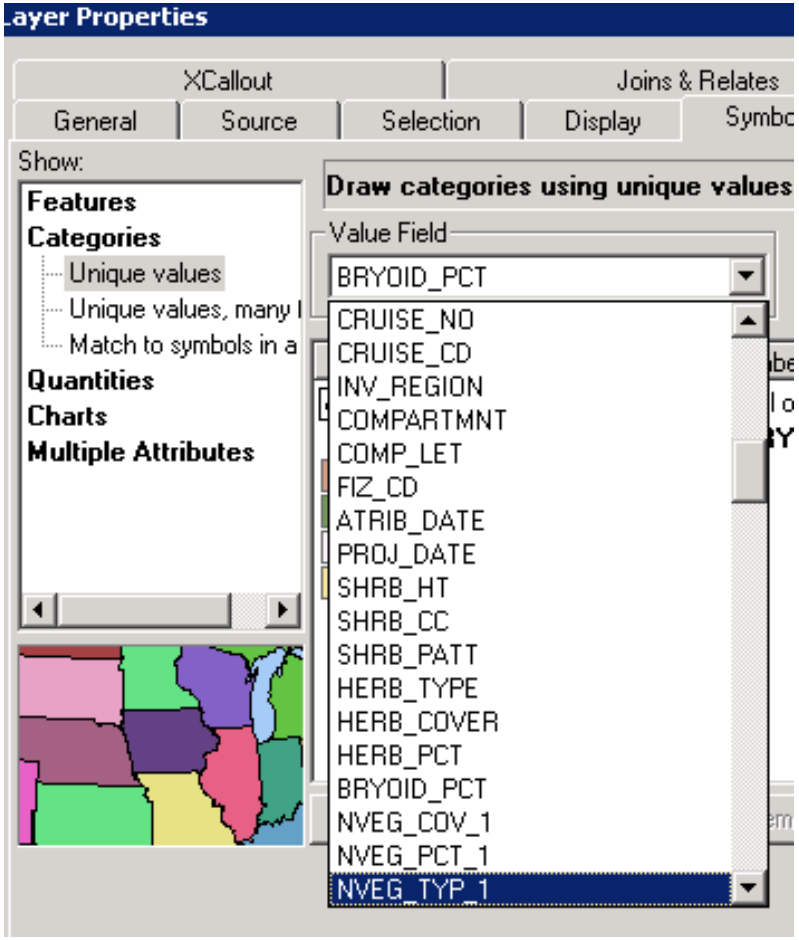
HUE *, shape, pattern e.g. soil types, schools versus churches

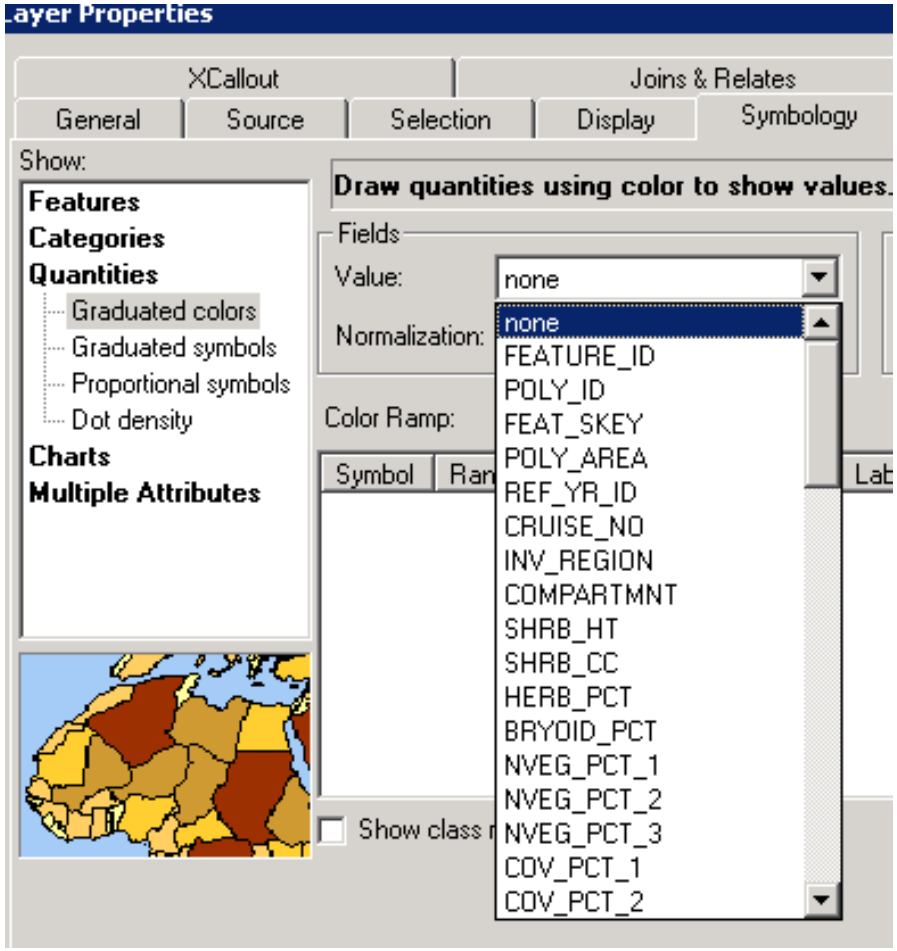
** see upcoming slides*

Quantitative: [interval / ordinal]

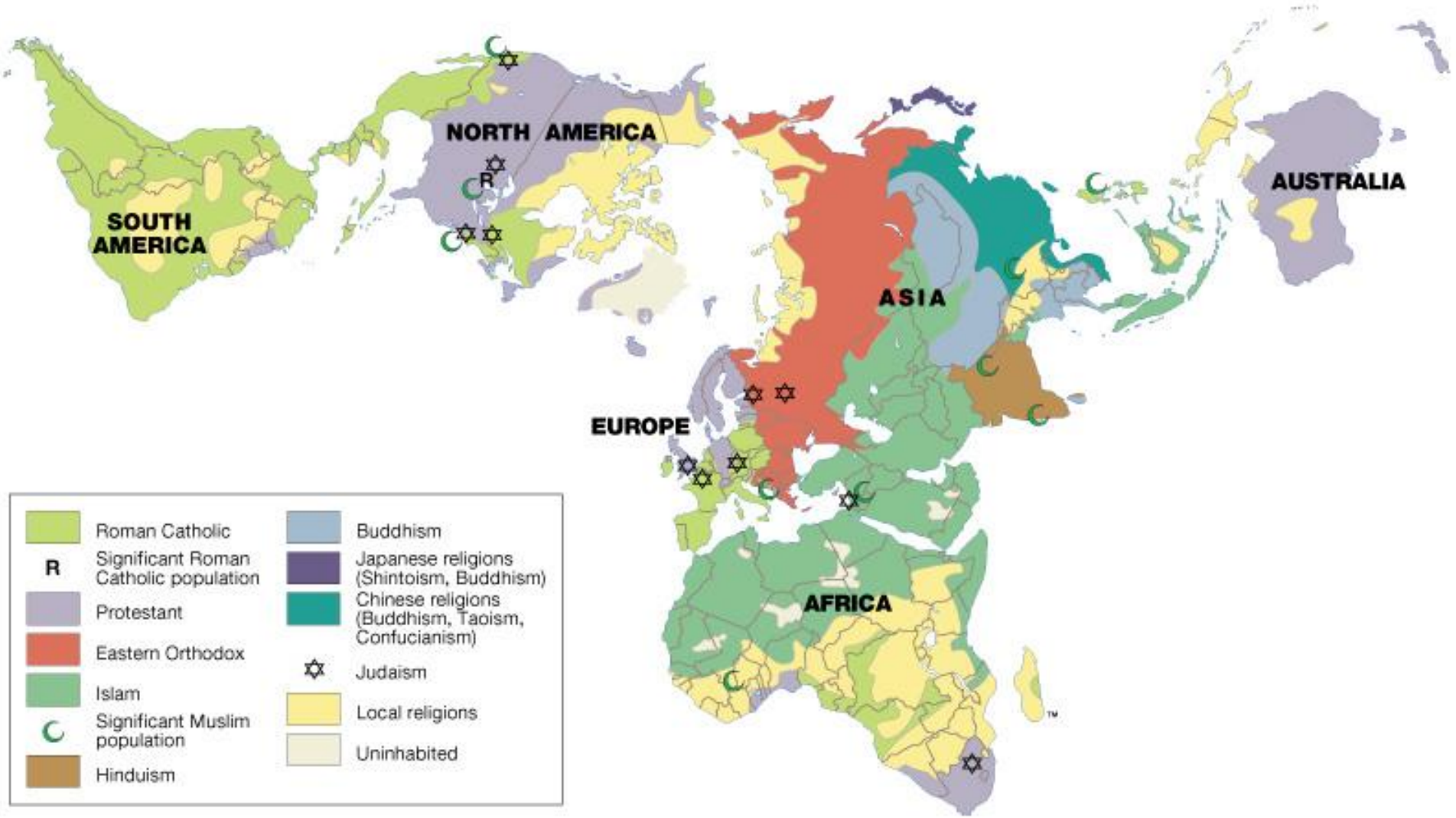
SIZE, tone, chroma, value e.g. population densities, city sizes

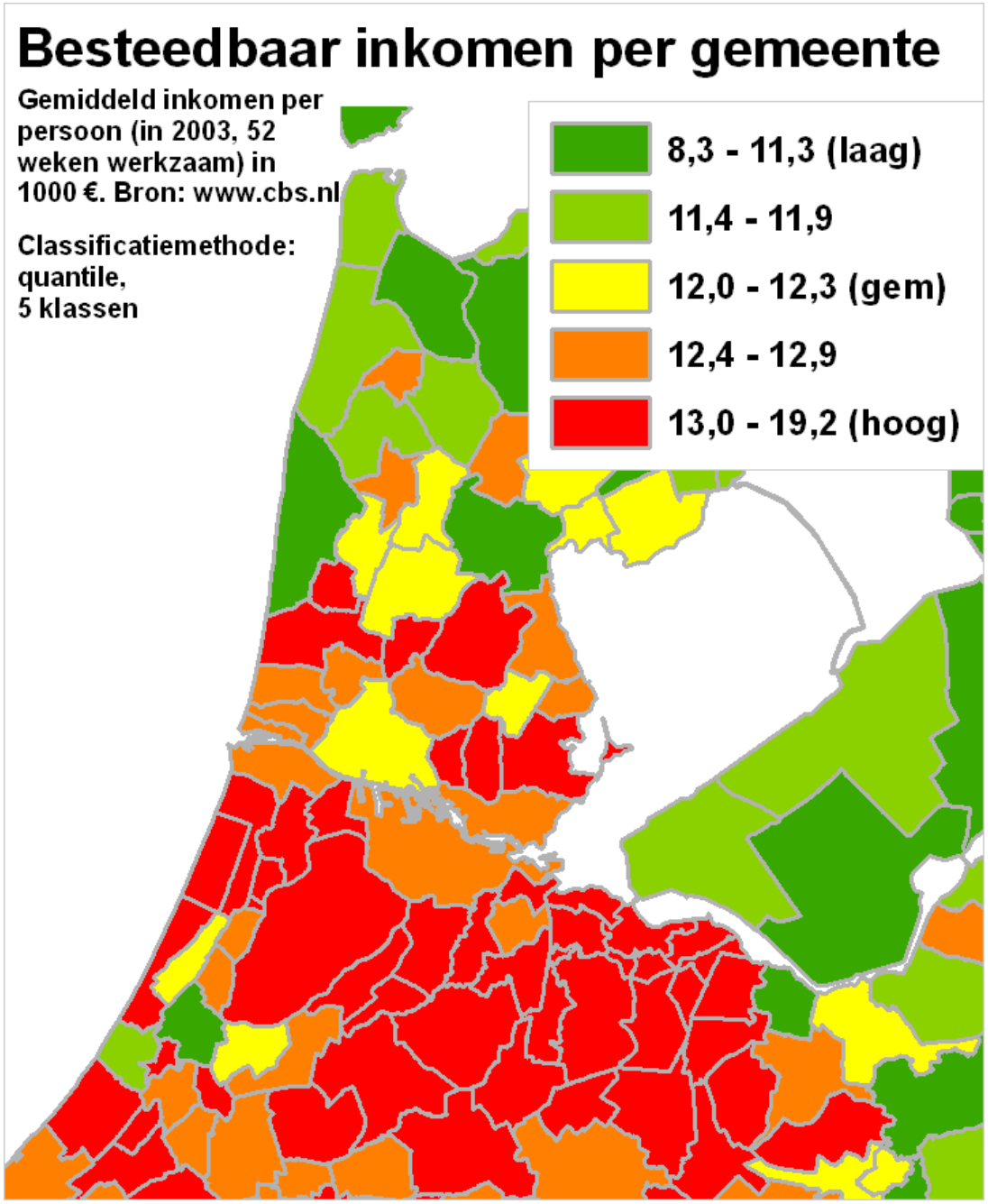
ArcGIS – categories v quantities menus





Qualitative (nominal/categorical) data





Colour ramp for quantitative data

(good example)

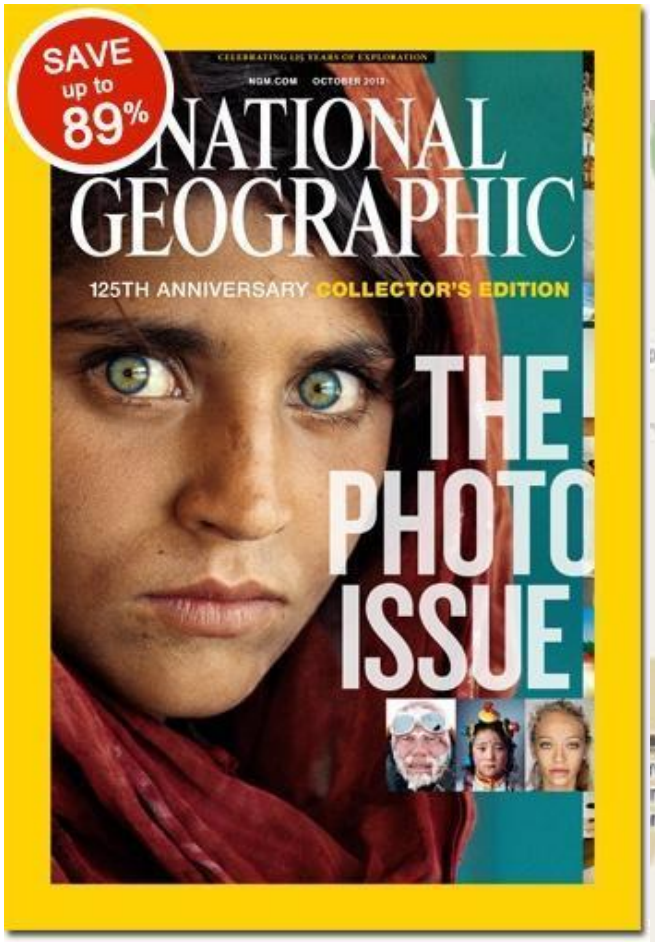
Red = highest values

•RED is reserved for importance due to its visual impact
- as it has the longest wavelength and 'advances' (blue retreats)

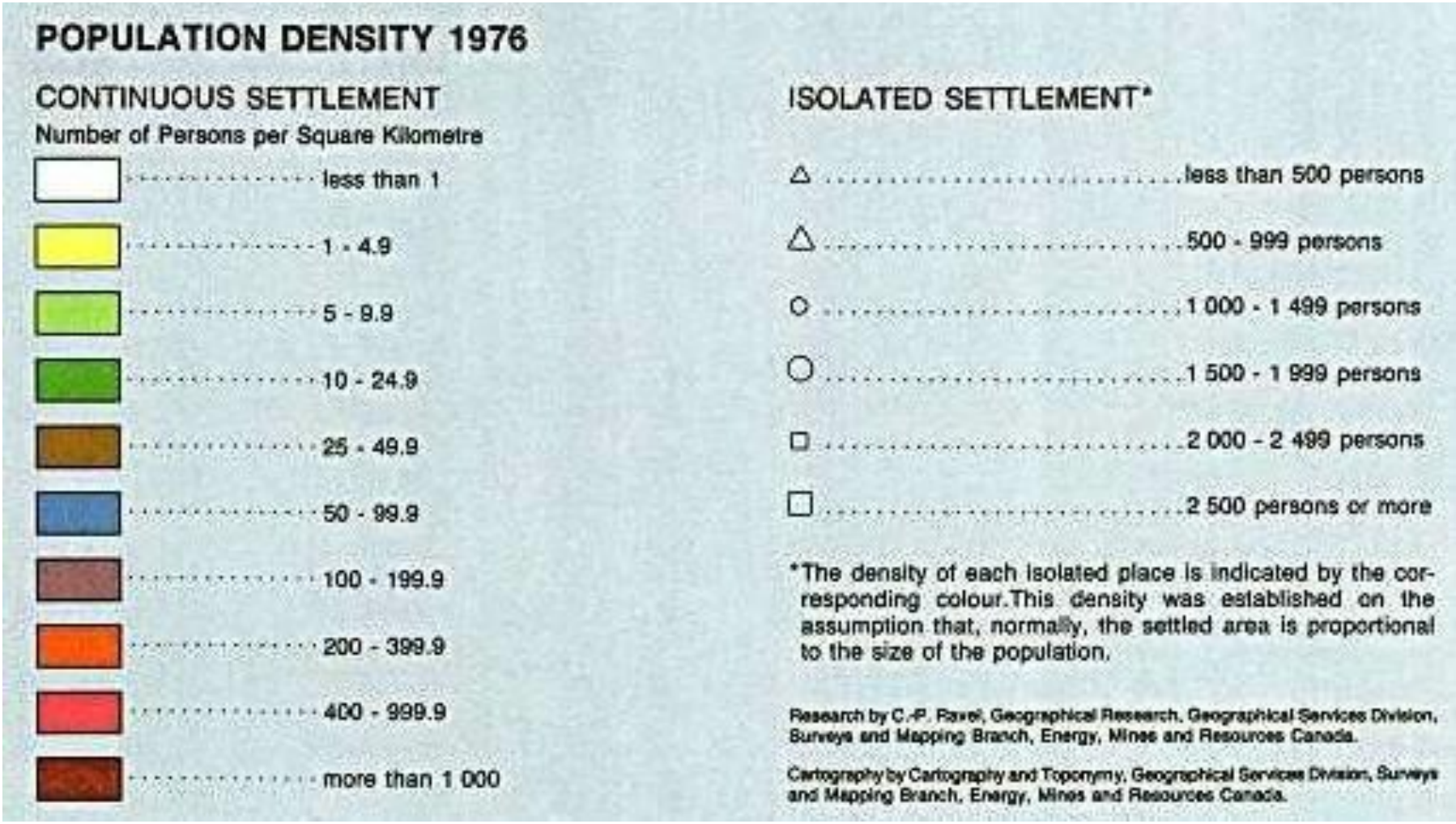
** Red – implies importance: / 'danger' (roads)

Universal STOP sign

Yellow is next to red in the colour spectrum



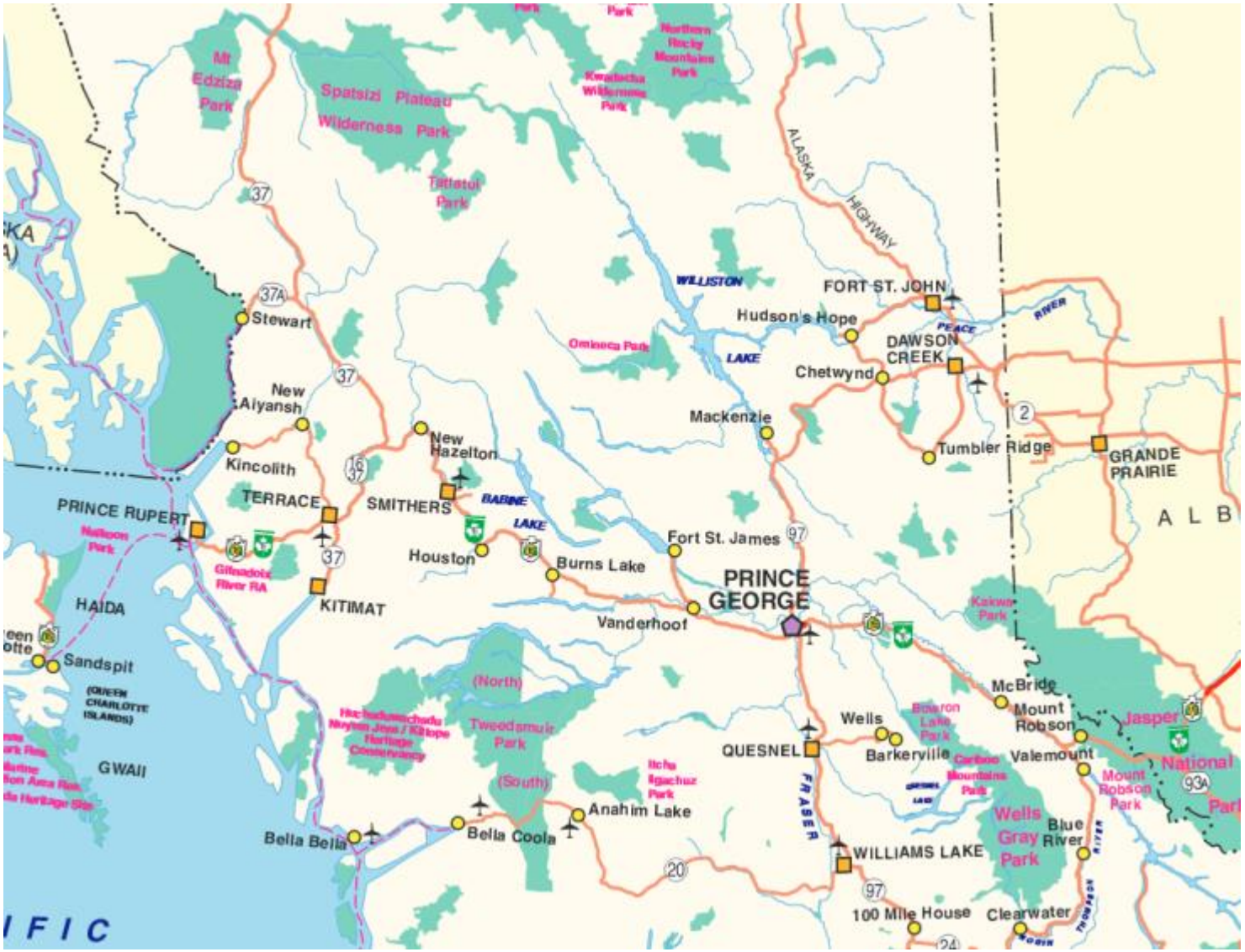
Poor use of colours, size and shape



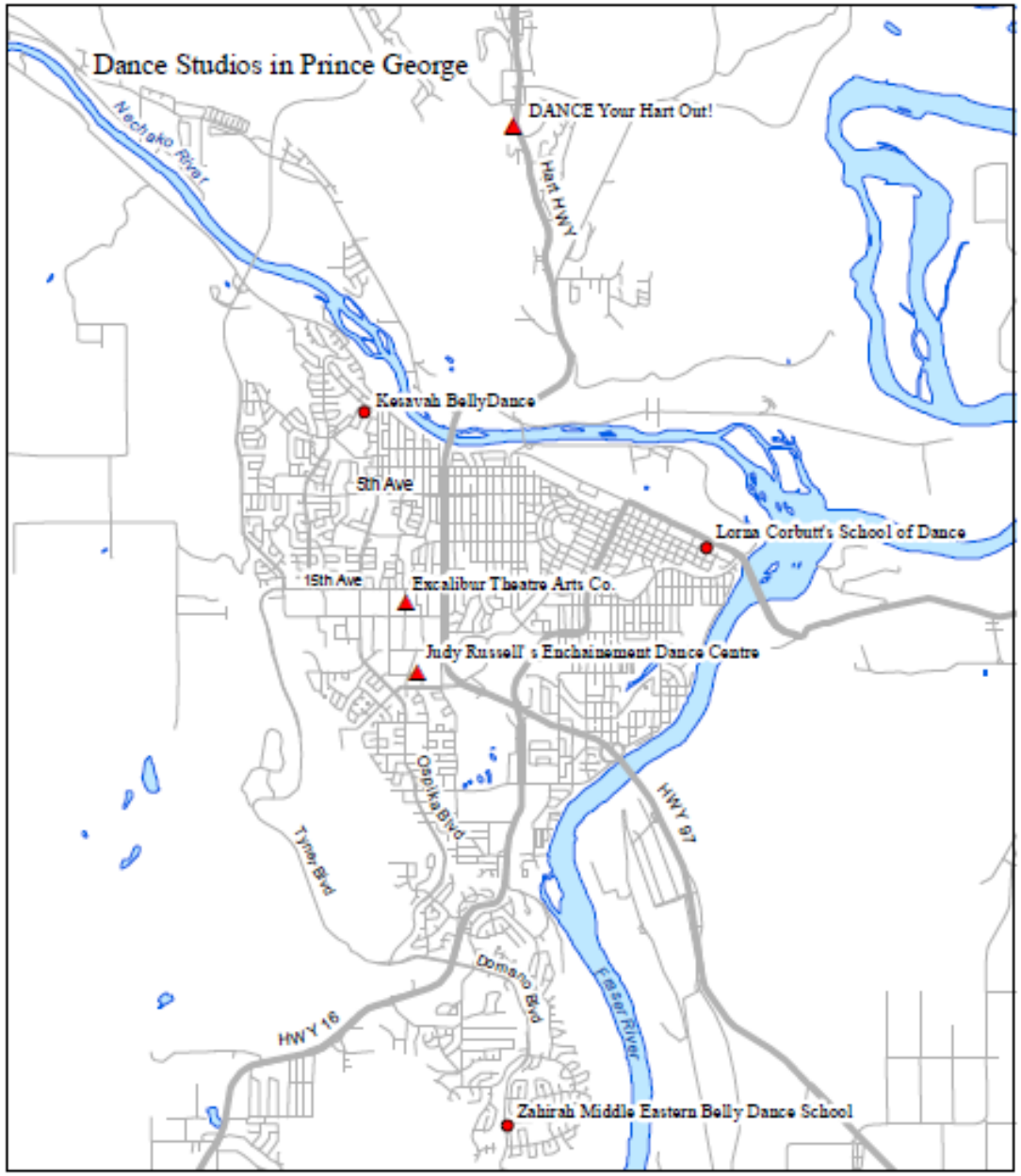
Atlas of Canada …. Shame !

3a. Other factors: map purpose

e.g. parks / road map – what features are more important in each case …



3b. Other factors: cost and media



Colour costs v Monochrome:

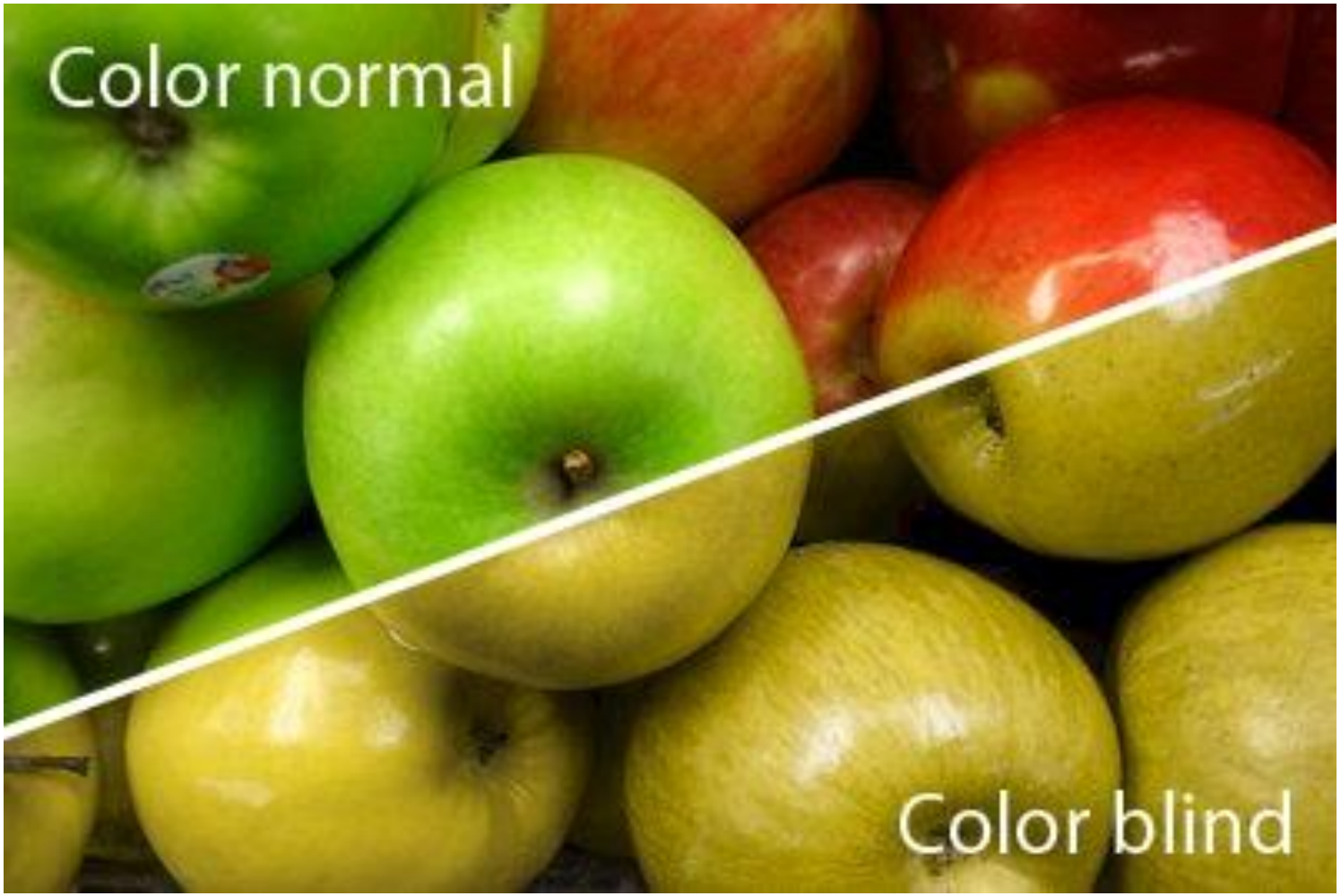
- In this case, colour could be avoided if not needed

- online no cost
- monochrome 1x
- colour photocopy 10x
- publication 1000x ?

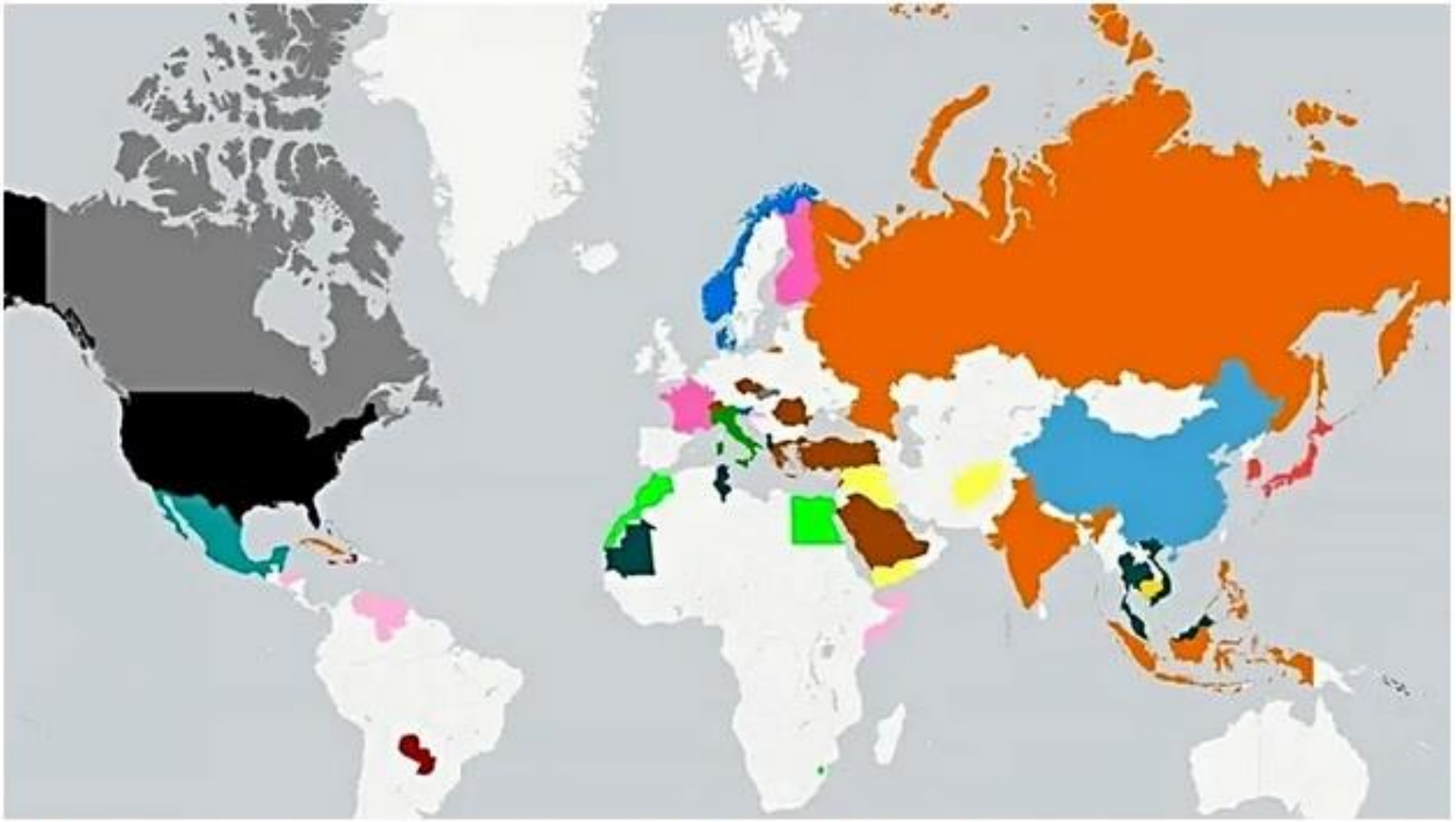
- Don't always use colour, <u>just</u> because you can …
but in 2024, you often can …

3c. More on colour ….

- colour blindness ~5% men and 1% of women



https://www.washingtonpost.com/travel/2023/01/12/color-blindness-glasses-museums



The Rudest Countries In The World: Ranked

Can you tell which is #1 from the colours ?
Internet bait: the goal is to lure you in, not to give you the picture at a glance