MONASH University

MONASH
INFORMATION
TECHNOLOGY

FIT3179 Data Visualisation

Week 06 – Part 1: Colour

GROUP OF EIGHT AUSTRALIA

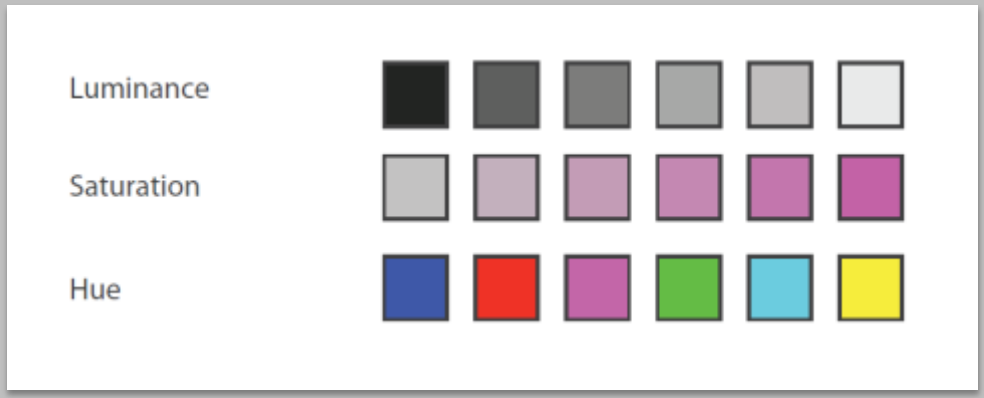
MONASH University

VAD chapter 10

Colour

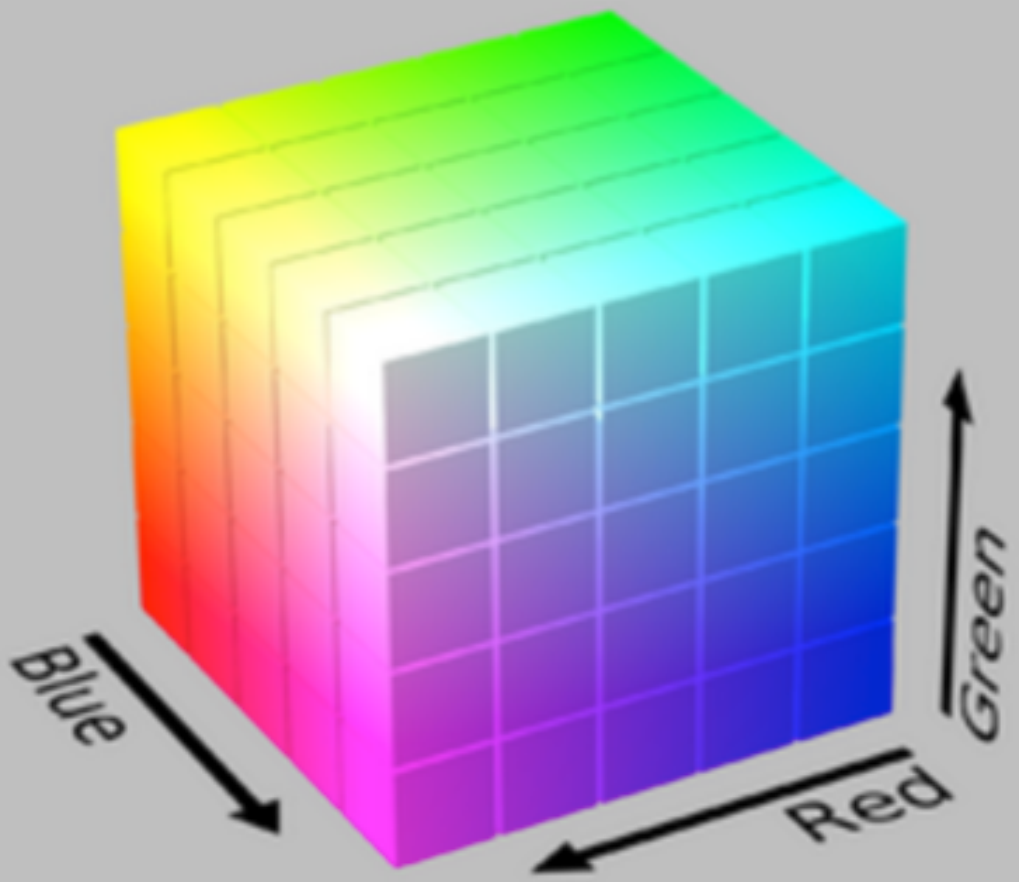
- Colour spaces
- Effective use of colour for data visualisation

Colour Spaces



Colour Spaces

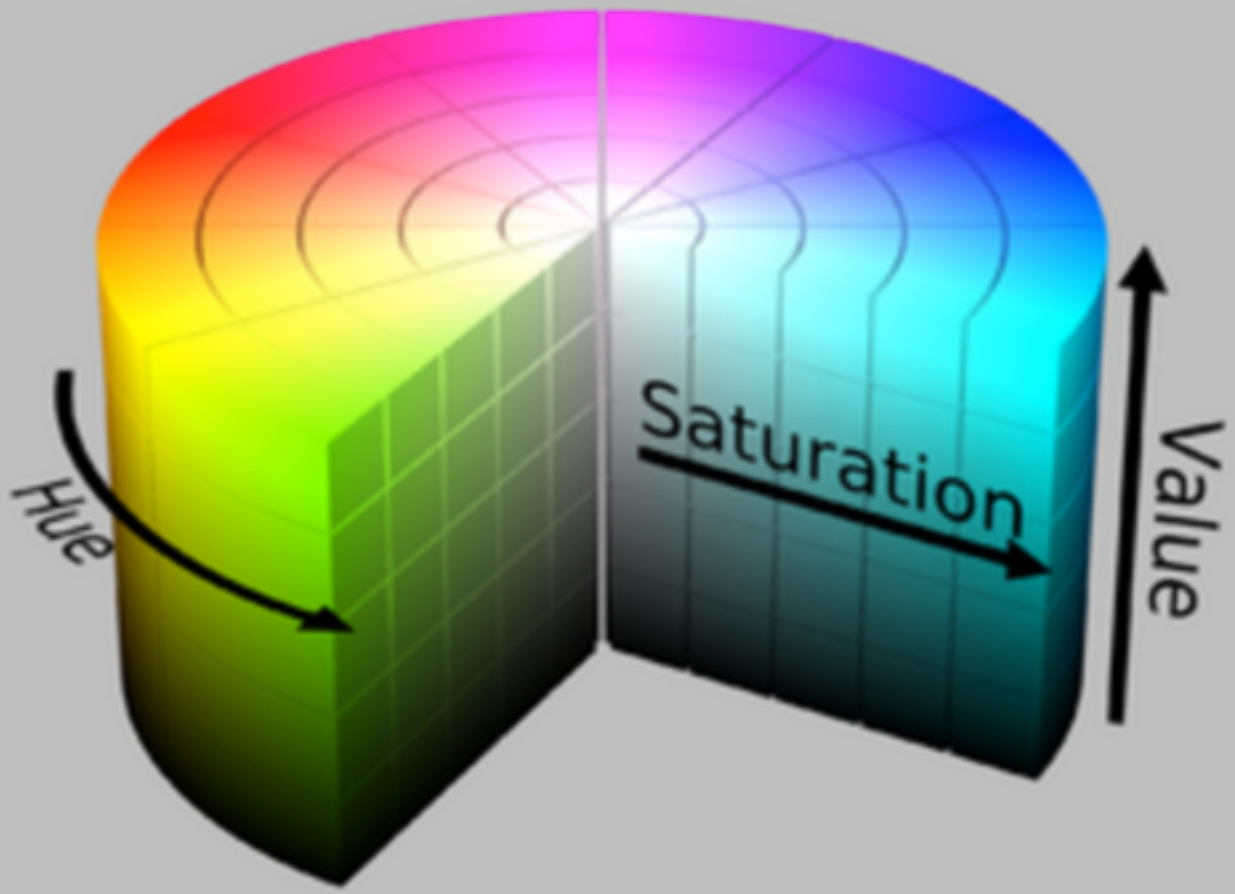
RGB



https://en.wikipedia.org/wiki/HSL_and_HSV

Colour Spaces

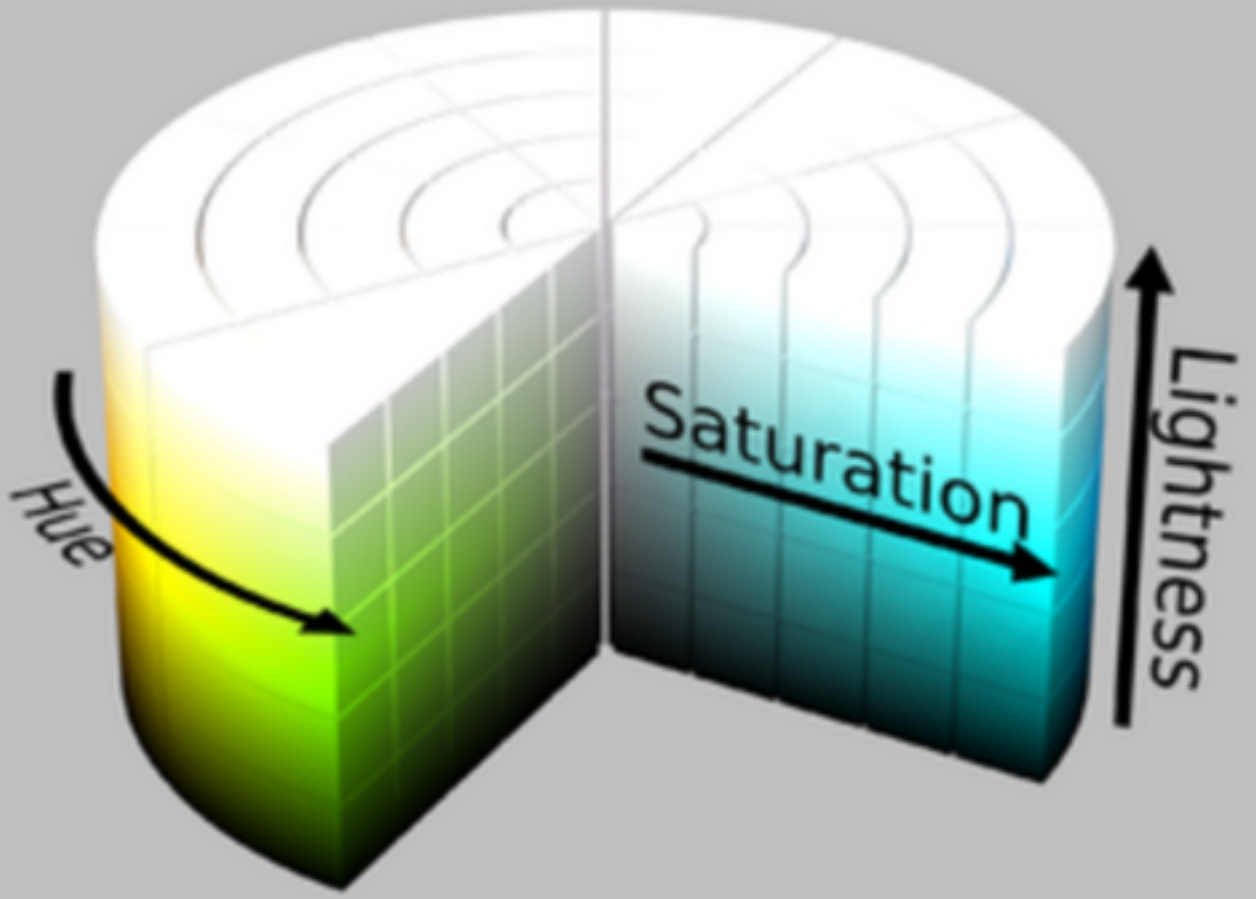
HSV



https://en.wikipedia.org/wiki/HSL_and_HSV

Colour Spaces

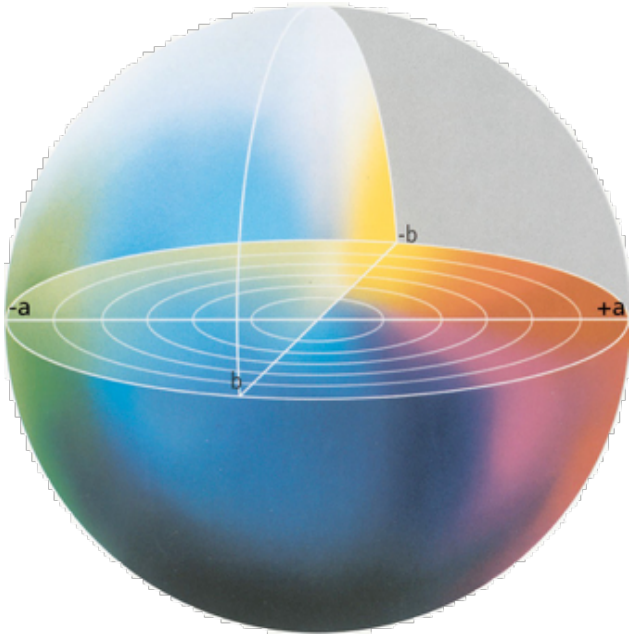
HSL

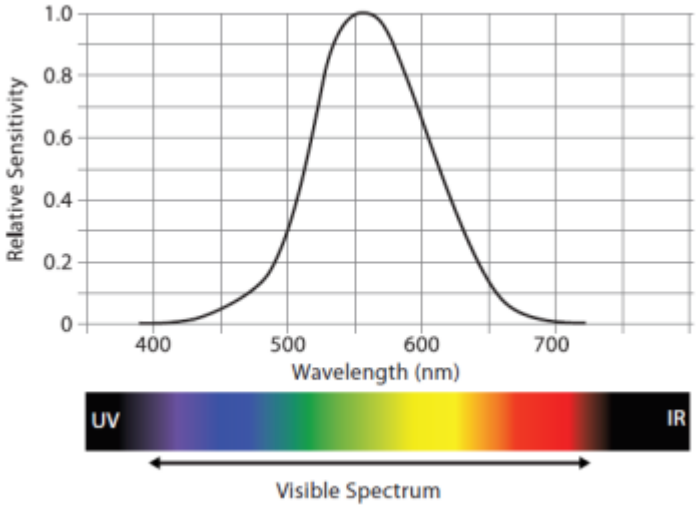


https://en.wikipedia.org/wiki/HSL_and_HSV

L*a*b*: Perceptually Linear Colour space

- L*: luminance axis
- a and b: red-green and blue-yellow axes





Colour Spaces

- RGB, HSV, HSL, XYZ, L*a*b* have 3 axes
- RGB, HSV, HSL, XYZ are not visually equidistant, that is, the numerical mean of two colours is not the visual mean of these colours.
- L*a*b* is visually equidistant.
- HSV and HSL used for colour pickers, because of their intuitive axes.
- XYZ and L*a*b* used for colour management, that is, matching colours between different devices.

May 29, 2018
by Lisa Charlotte Rost

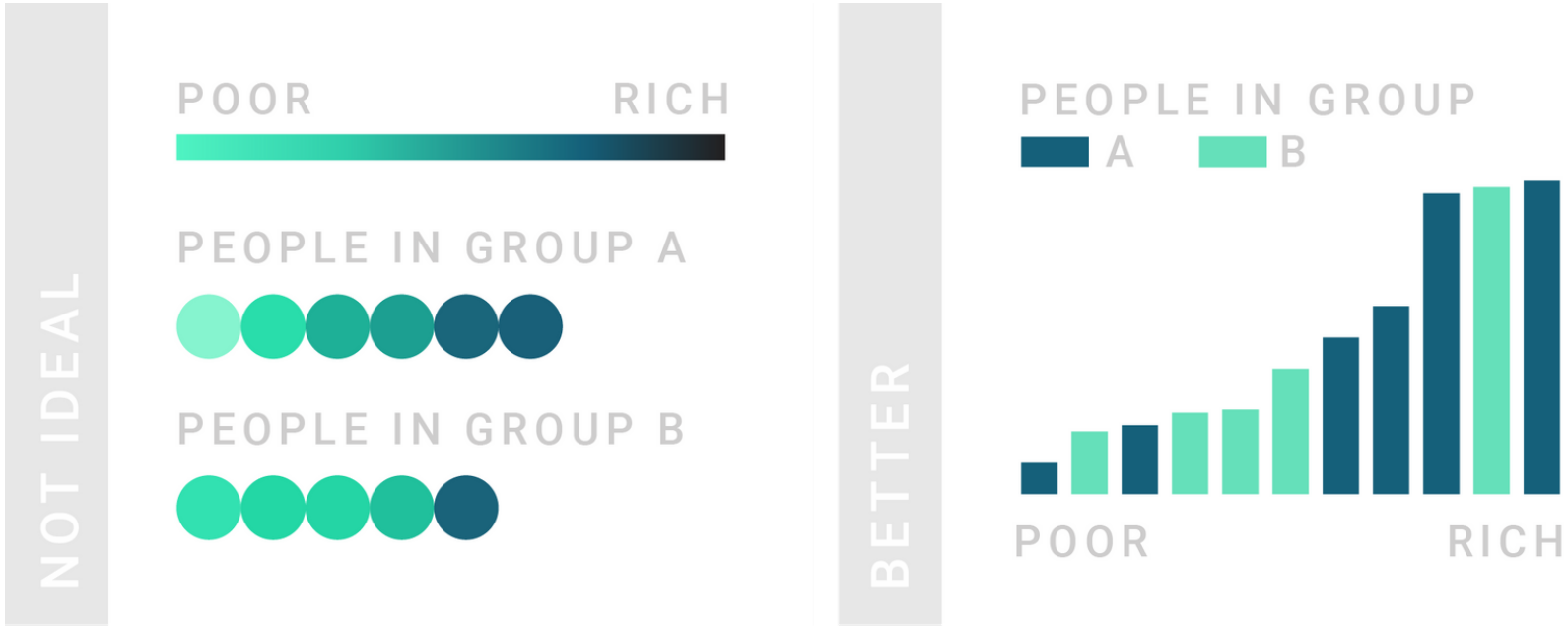
Thoughts & How To's

What to consider when choosing colors for data visualization

Data Visualisation can be defined as representing numbers with shapes – and no matter what these shapes look like (areas, lines, dots), they need to have a color. Sometimes colors just make the shapes visible, sometimes they encode data or categories themselves. We'll focus mostly on the latter in this article. But we'll also take a general look at colors and what to consider when choosing them:

https://blog.datawrapper.de/colors/

Choosing Colour for Data Visualisation

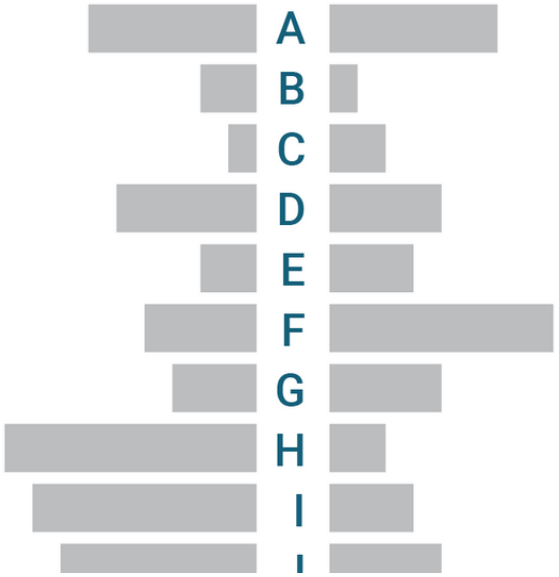


Source: Lisa Charlotte Rost, https://blog.datawrapper.de/colors/

Choosing Colour for Data Visualisation

NOT IDEAL

BETTER



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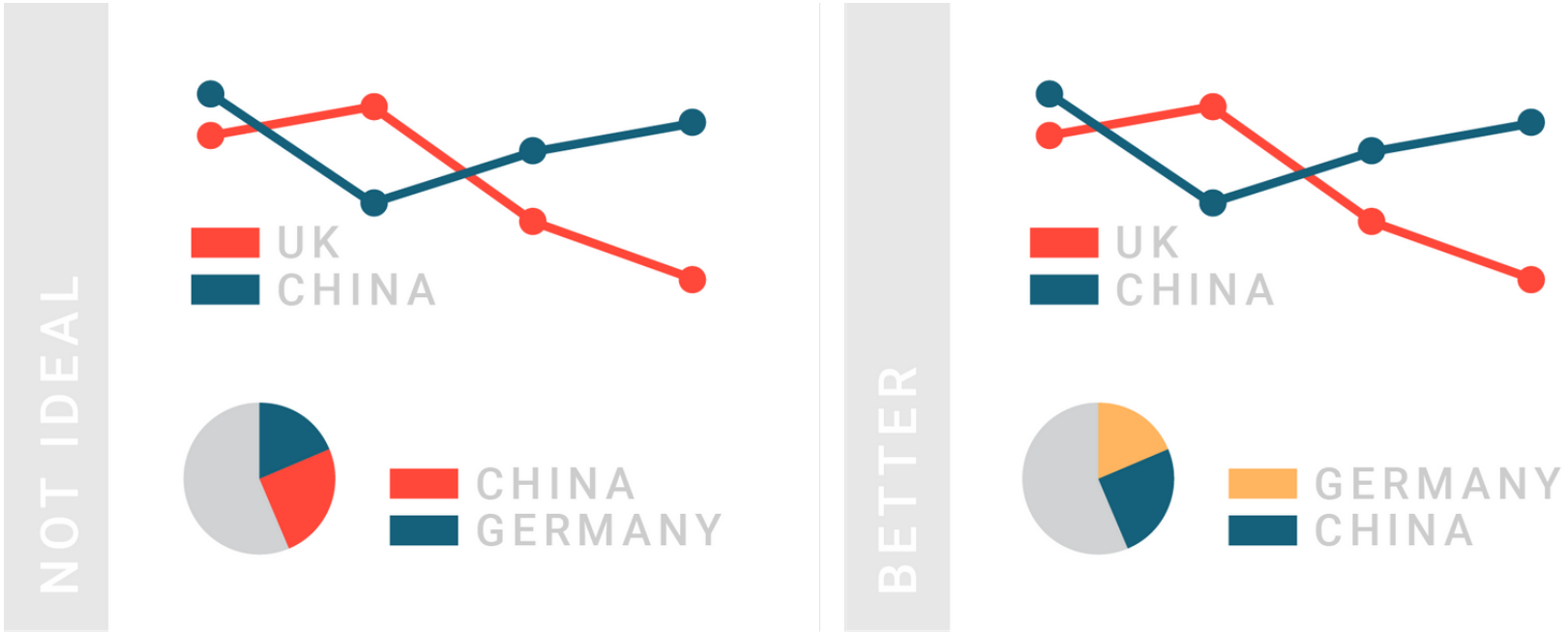

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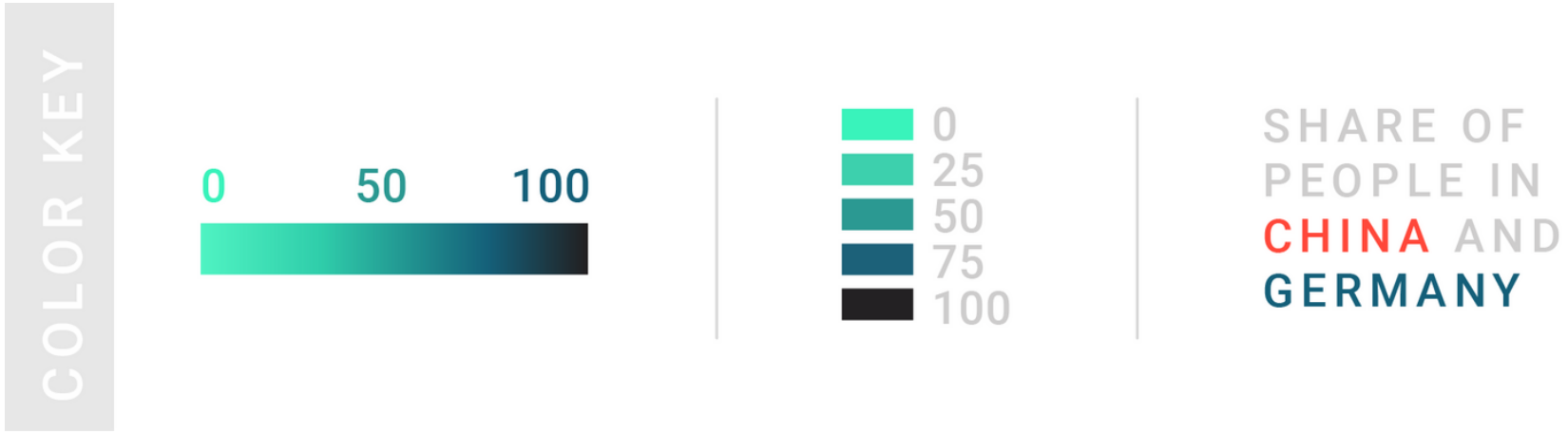

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Choosing Colour for Data Visualisation

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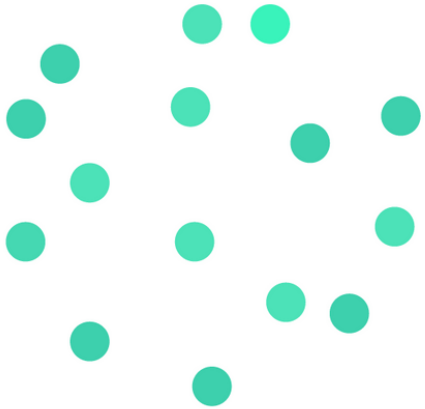

BETTER

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CAN CUBA STAY AFLOAT?

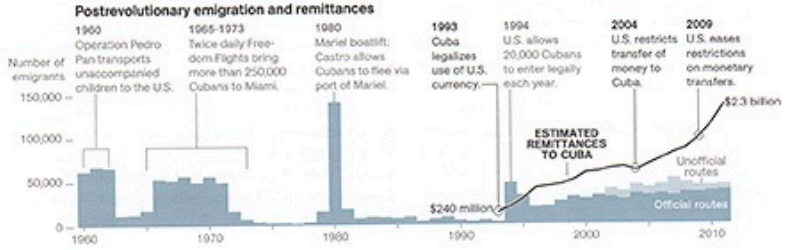
Hampered by the U.S. embargo and the collapse of the U.S.S.R. in 1991, Cuba's economy has floundered. Today it is precariously propped up by Venezuelan aid. Production of sugar—and most agricultural and industrial products—has plummeted since the 1959 revolution. Its best hope for growth: oil, nickel—and people. Tourism is up, along with cash sent to residents from abroad.

CUBANS OUT, DOLLARS IN

Among the most reliable sources of hard currency are the billions in remittances flowing in from the Cuban diaspora and the more than two billion dollars spent annually by tourists. The number of people leaving the island each year fluctuates with the twists and turns of politics and policy.

Cuban native and NGS cartographer Juan Valdés narrates an emigration time line.

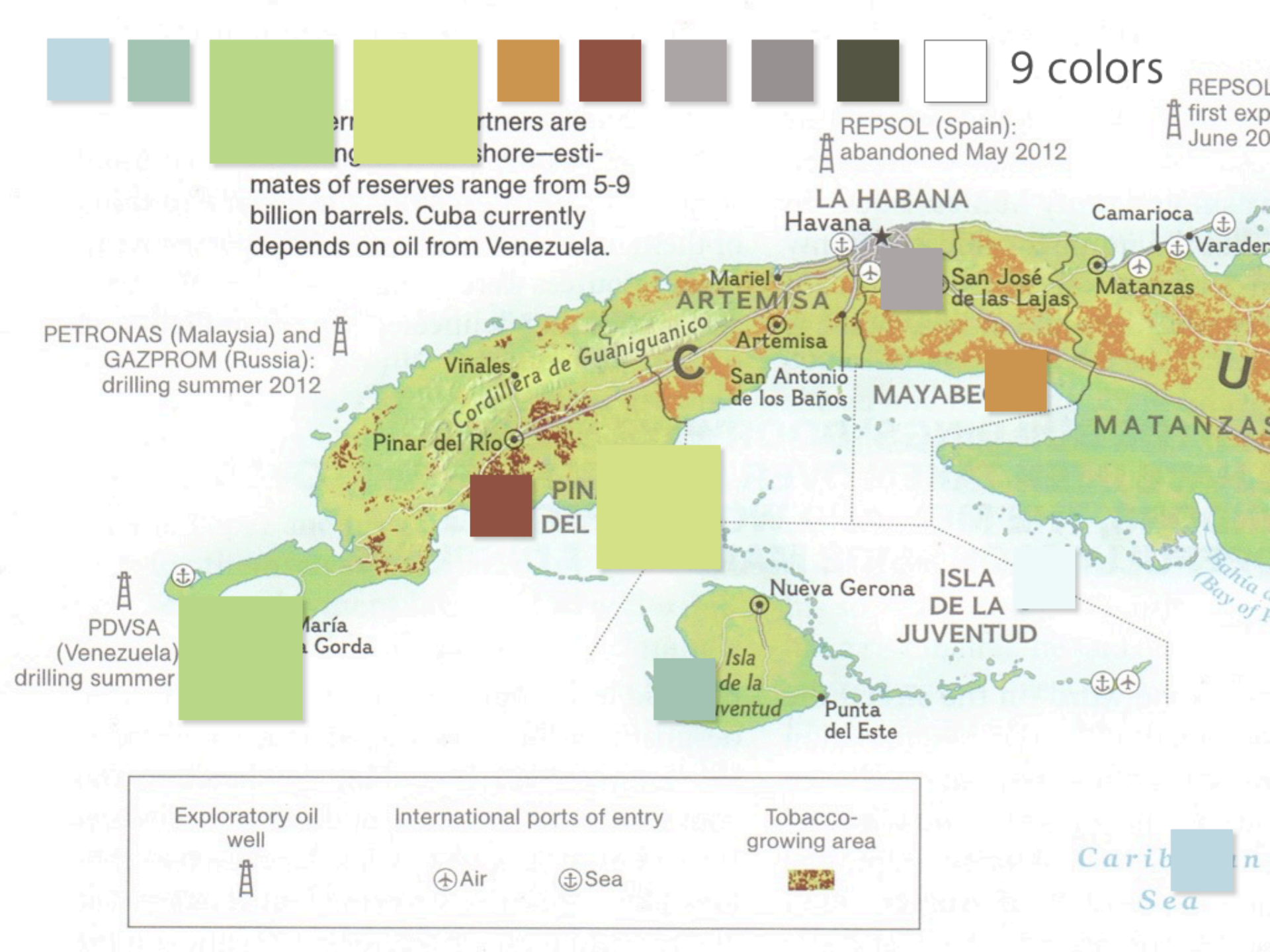
Postrevolutionary emigration and remittances



Cuban nationals abroad and tourists by country of origin

MARTIN GAMACHE, NGM STAFF; ALEXANDER STEGMAIER AND JUAN JOSÉ VALDÉS, NG MAPS

SOURCES: CUBAN NATIONAL STATISTICS OFFICE; FAO; U.S. CENSUS; U.S. CUSTOMS AND BORDER PROTECTION; UN STATISTICS DIVISION; DEVELOPMENT RESEARCH CENTRE ON MIGRATION, GLOBALISATION AND POVERTY; MIGRATION POLICY INSTITUTE; EMILIO MORALES AND JOE SCARPACI, HAVANA CONSULTING GROUP; ARCH INTTER, CARLETON UNIVERSITY; JORGE R. PIÑON, UNIVERSITY OF TEXAS AT AUSTIN; MODIS LAND COVER, NASA LP DAAC


9 colors
rtners are
shore—esti-
mates of reserves range from 5-9
billion barrels. Cuba currently
depends on oil from Venezuela.
REPSOL (Spain):
abandoned May 2012
REPSOL
first exp
June 20
LA HABANA
Havana
Camarioca
Varader
Mariel
ARTEMISA
Artemisa
San José
de las Lajas
Matanzas
PETRONAS (Malaysia) and
GAZPROM (Russia):
drilling summer 2012
Viñales
Cordillera de Guaniguanico
San Antonio
de los Baños
MAYABE
MATANZAS
Pinar del Río
PIN
DEL
PDVSA
(Venezuela)
drilling summer
María
Gorda
Nueva Gerona
ISLA
DE LA
JUVENTUD
Isla
de la
ventud
Punta
del Este
Exploratory oil
well
International ports of entry
Air
Sea
Tobacco-
growing area
Caribbean
Sea

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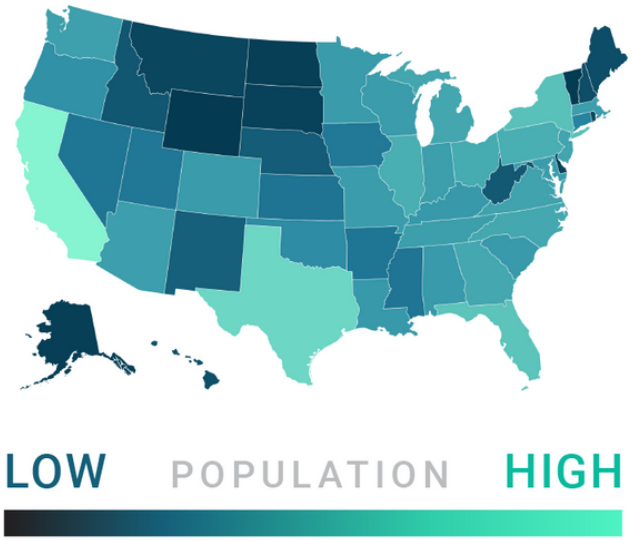

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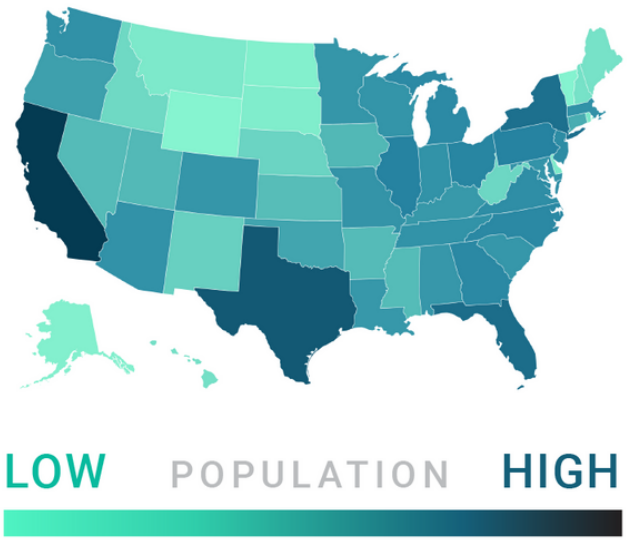

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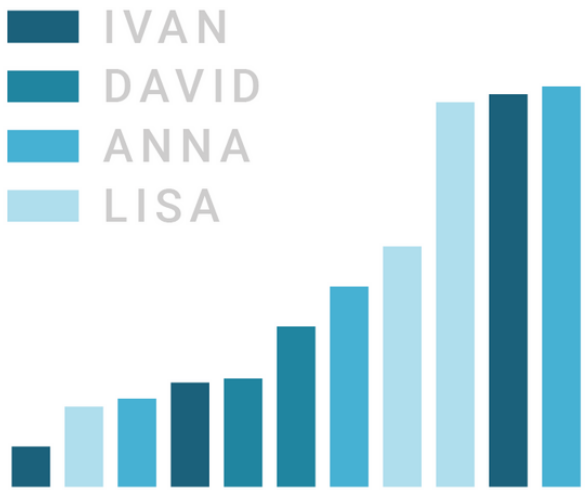

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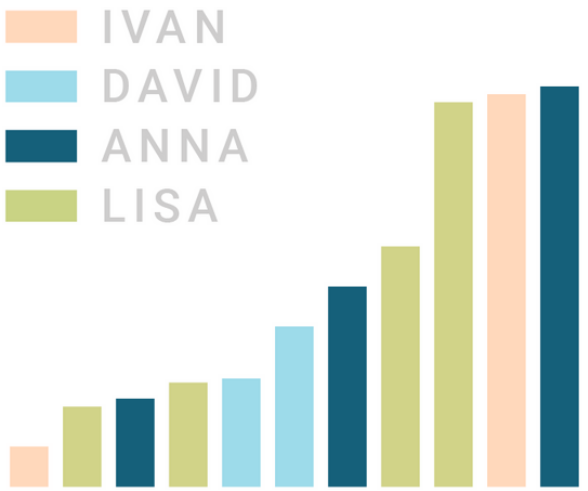

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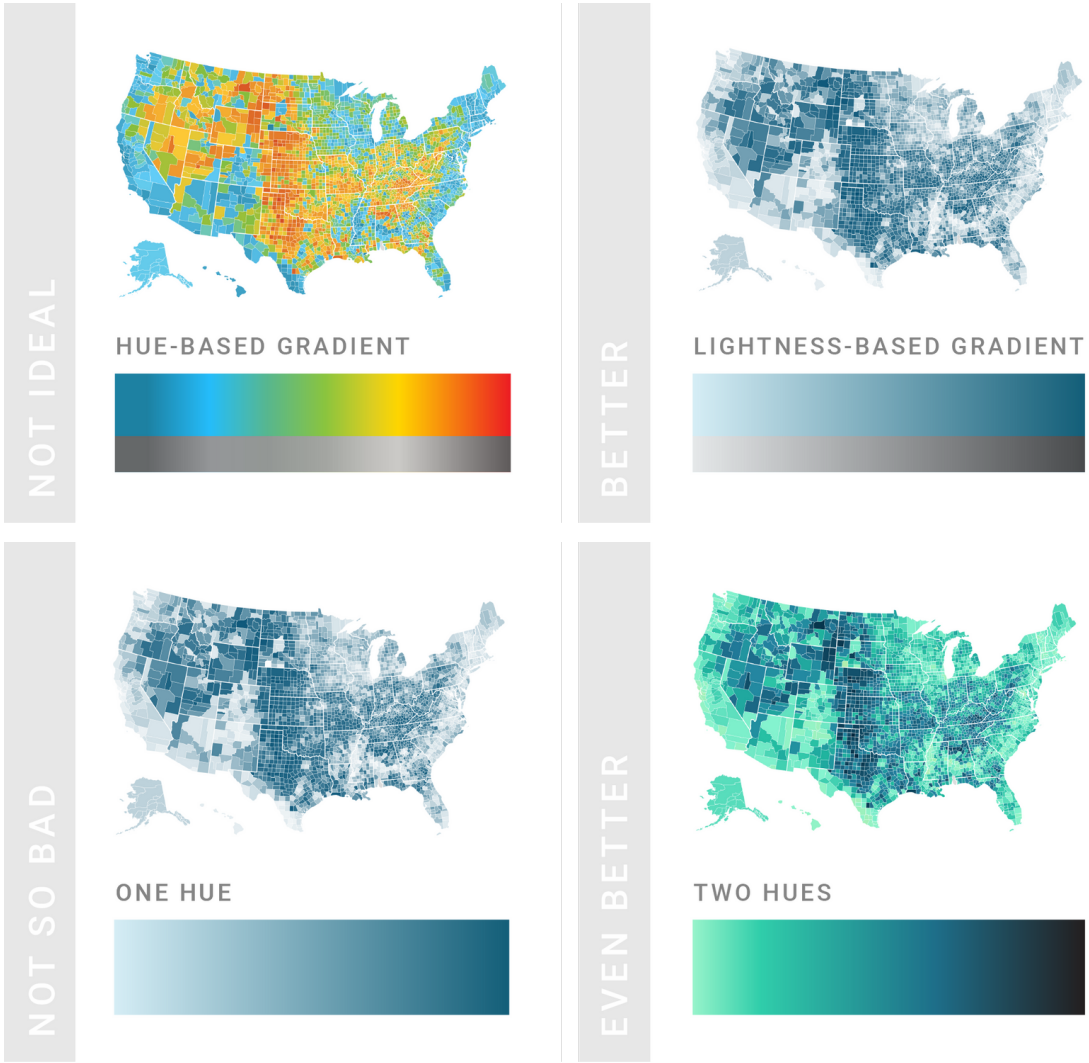
Choosing Colour for Data Visualisation



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The Evil Rainbow Colourmap

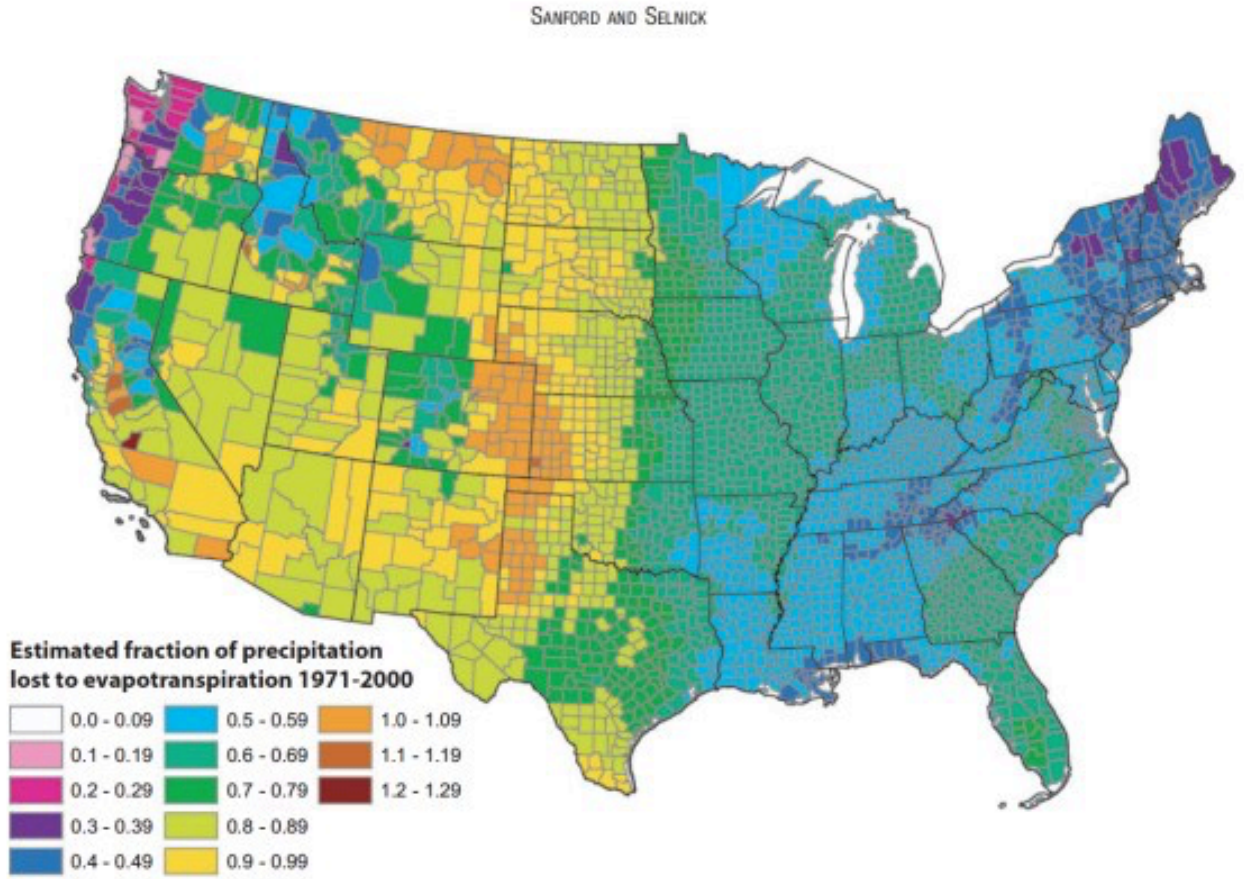
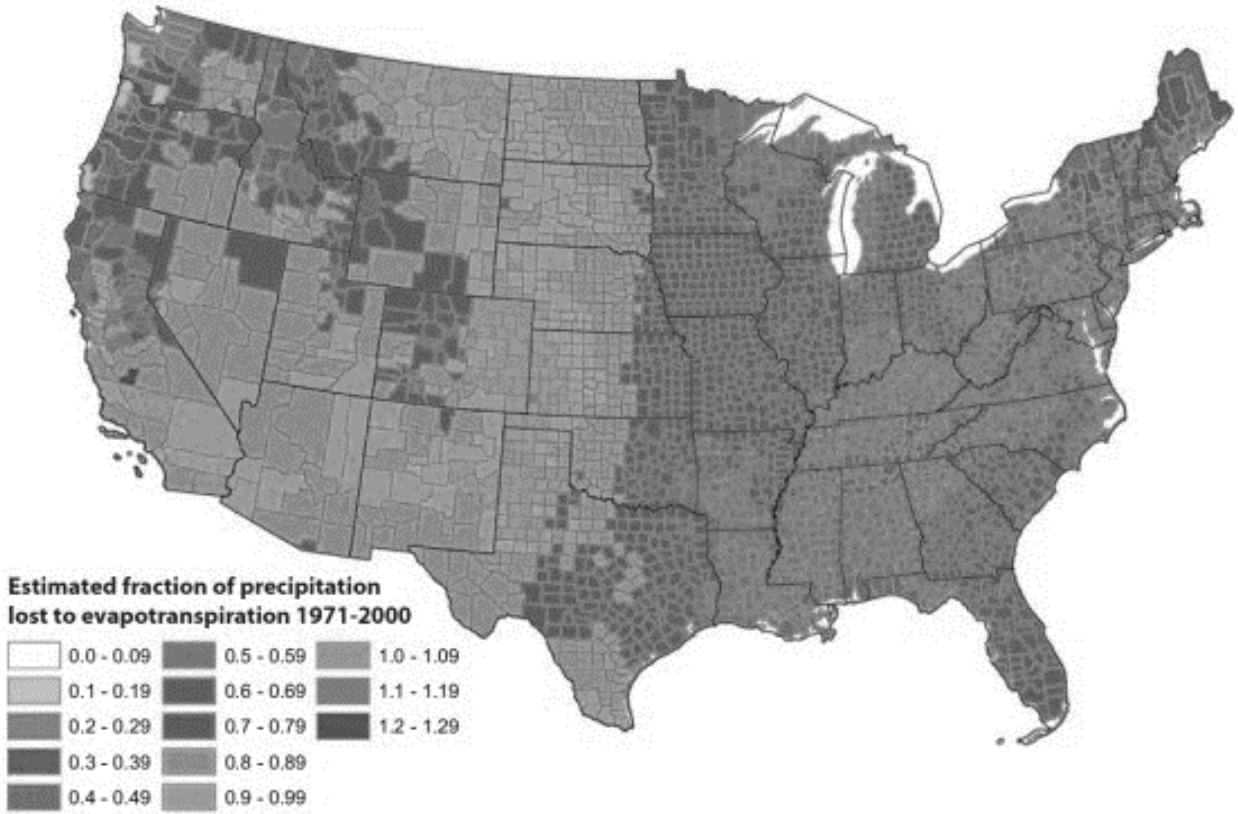


FIGURE 13. Estimated Mean Annual Ratio of Actual Evapotranspiration (ET) to Precipitation (P) for the Conterminous U.S. for the Period 1971-2000. Estimates are based on the regression equation in Table 1 that includes land cover. Calculations of ET/P were made first at the 800-m resolution of the PRISM climate data. The mean values for the counties (shown) were then calculated by averaging the 800-m values within each county. Areas with fractions >1 are agricultural counties that either import surface water or mine deep groundwater.

https://eagereyes.org/basics/rainbow-color-map

The Evil Rainbow Colourmap



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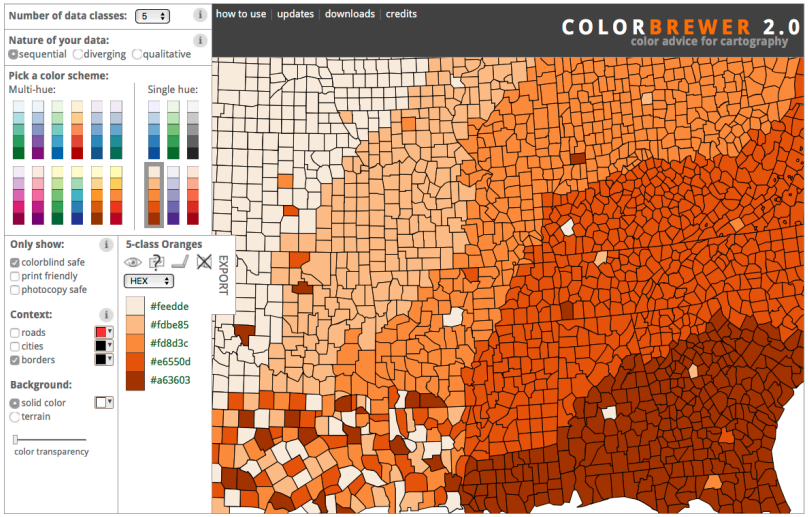
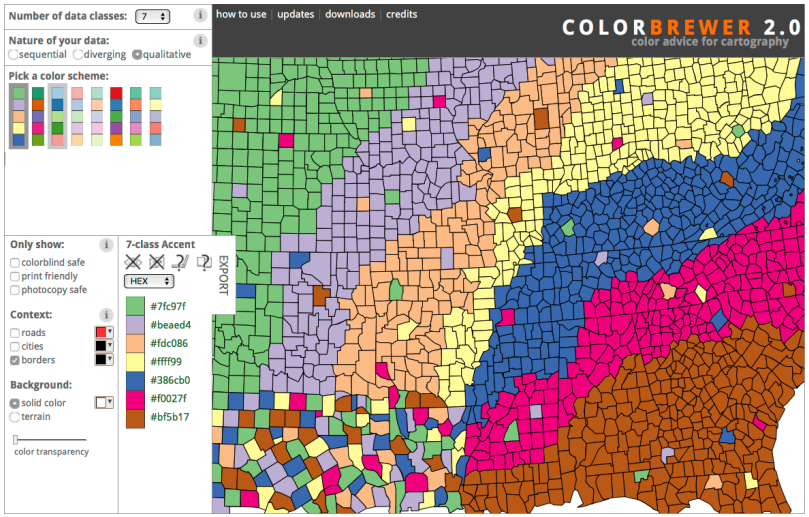
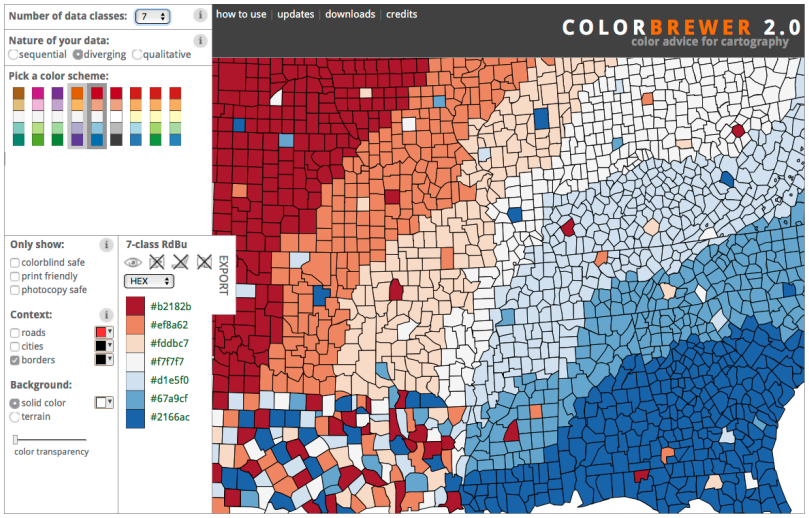
Sequential, diverging and qualitative colour schemes



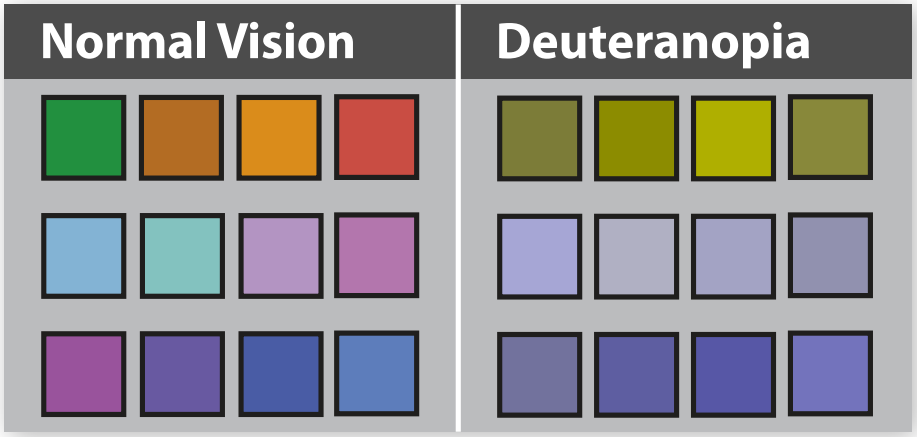




http://colorbrewer2.org

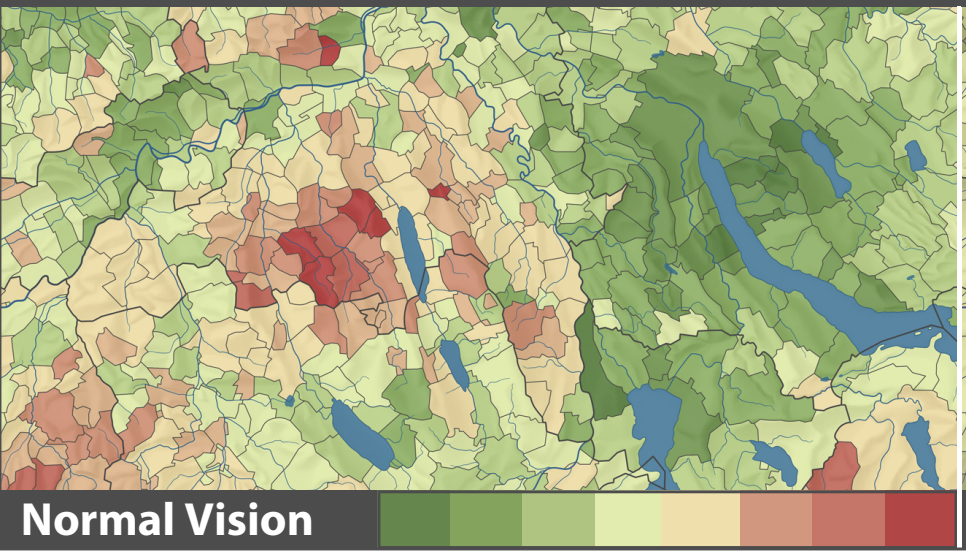
Colour for the colour vision impaired

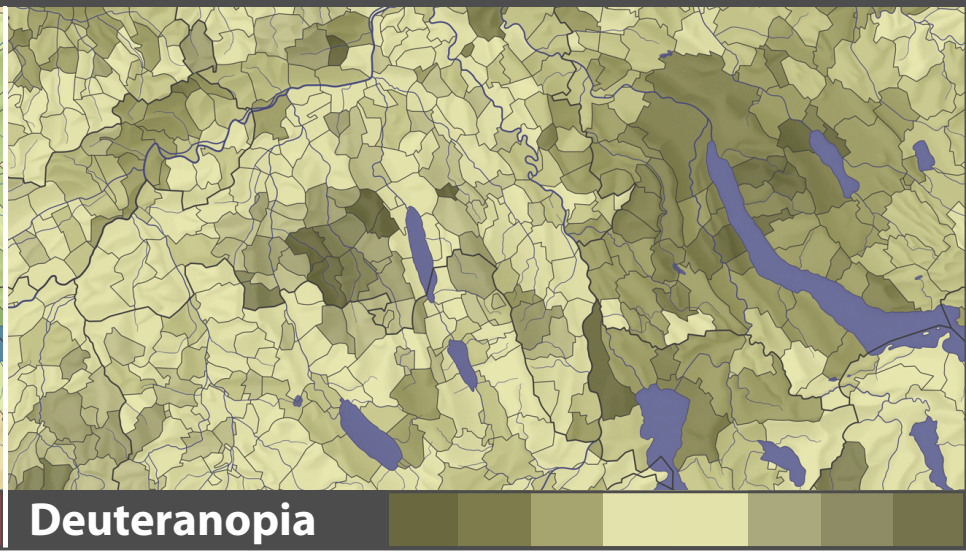
- 8% of all men have a color vision deficiency
- They mainly confuse red and green (protanopia and deuteranopia)



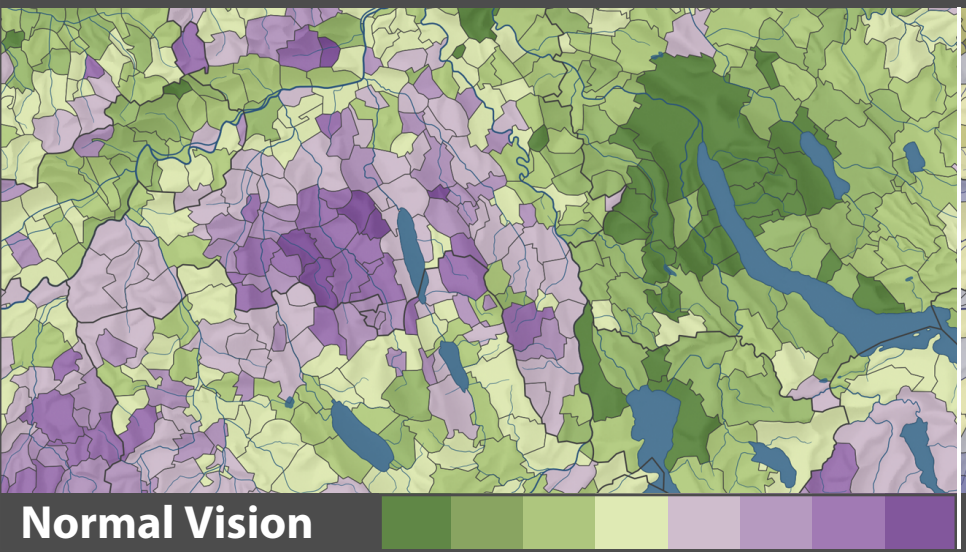
Colour for the colour vision impaired

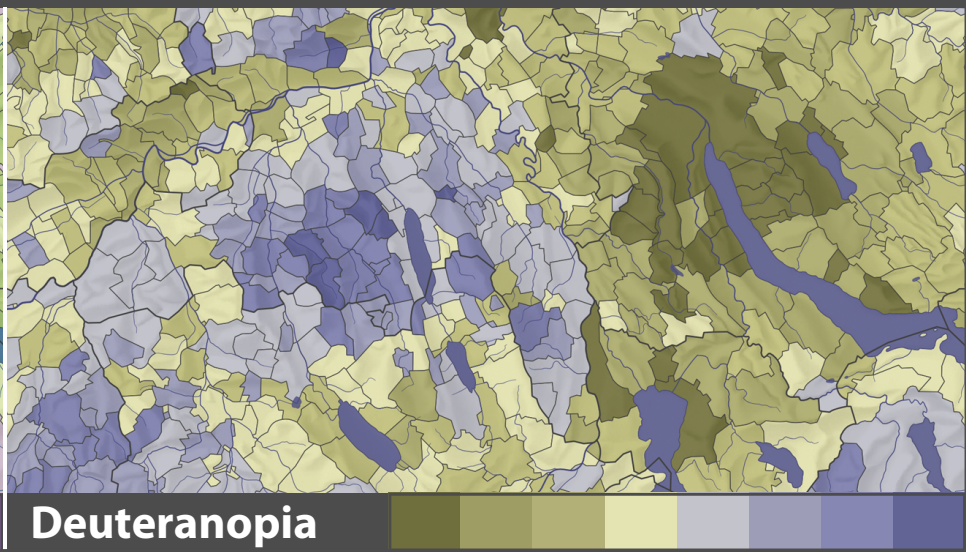
Diverging Red-Green Color Scheme



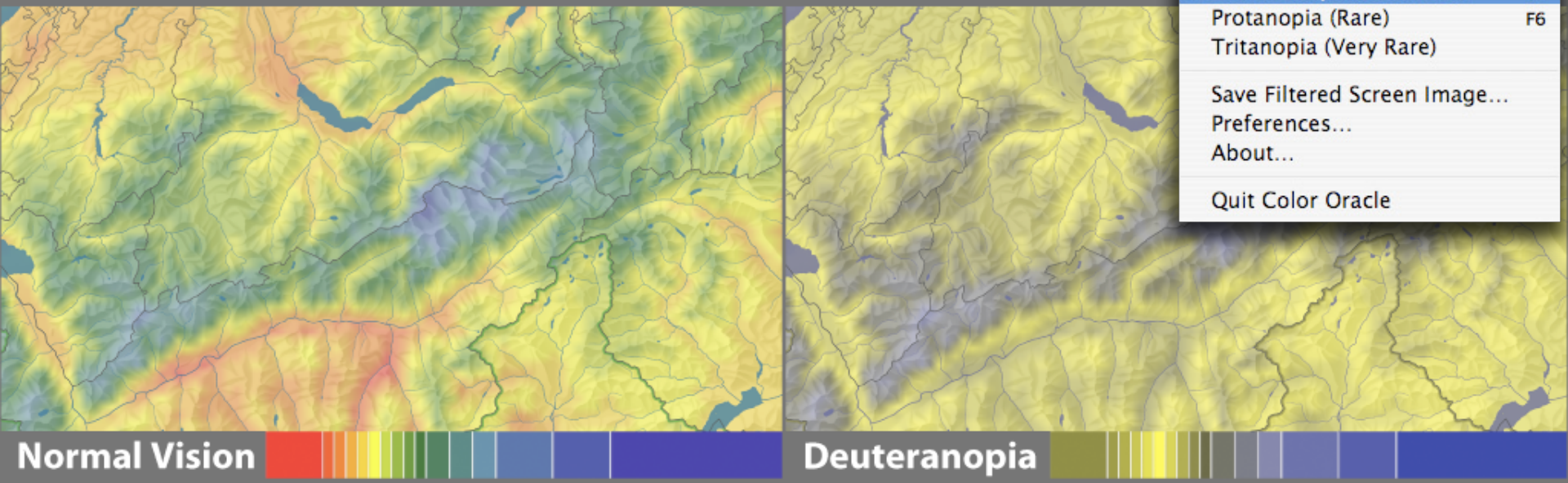


Diverging Purple-Green Color Scheme





Spectral Color Scheme



Normal Vision
✓ Deuteranopia (Common) F5
Protanopia (Rare) F6
Tritanopia (Very Rare)
Save Filtered Screen Image...
Preferences...
About...
Quit Color Oracle