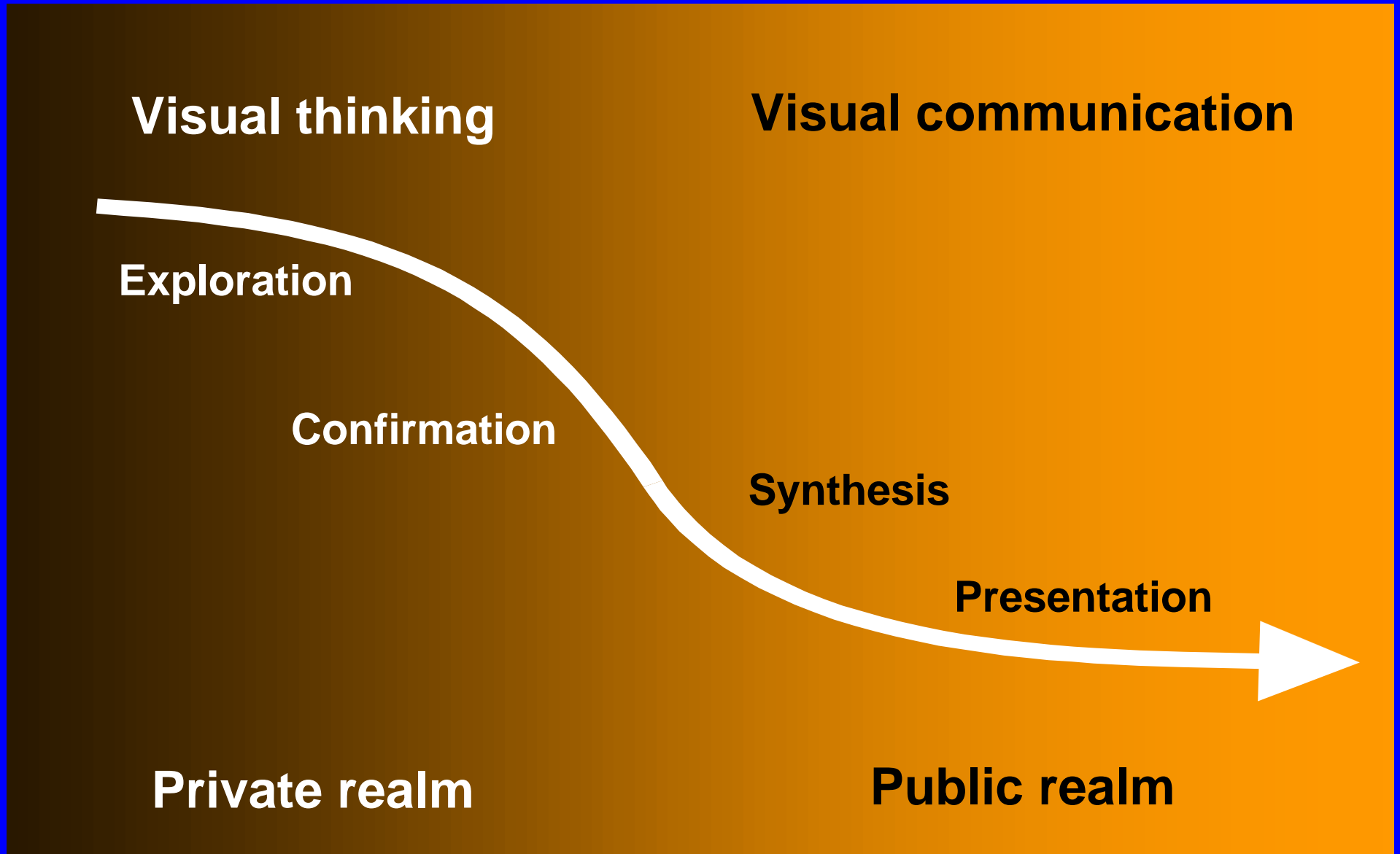


Thematic mapping

Cartographic abstraction



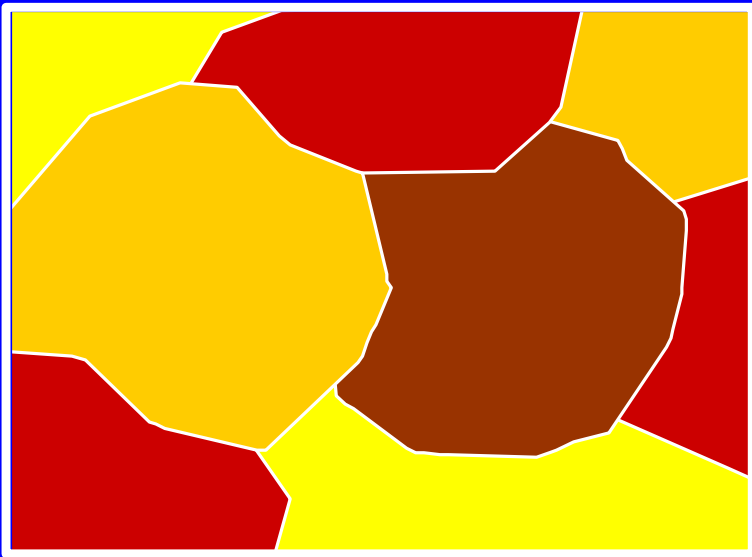
Two general types of maps

- **Topographic maps**
 - show outlines of selected natural and man-made features
 - often serves as frame of reference
- **Thematic maps**
 - show “geographical concepts” such as population density, climate, movement of goods

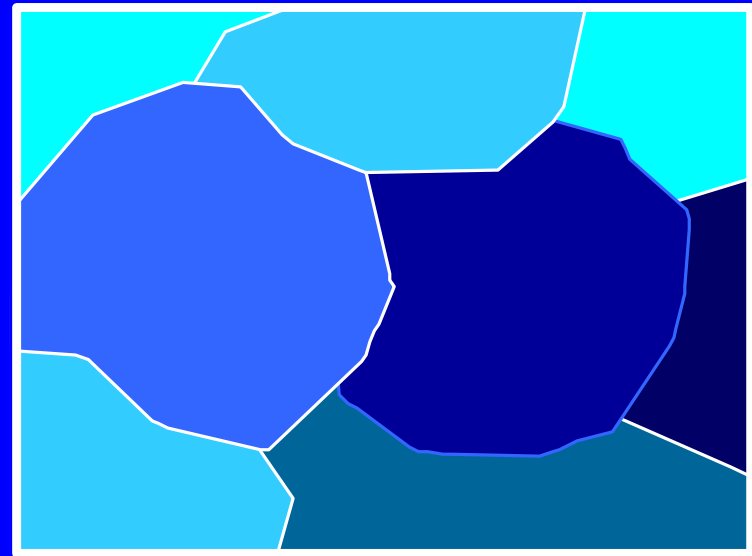
Choropleth maps

- **uses reporting zones such as districts**
- **shows data such as average income, mortality rates, or percentages**
- **boundaries of the zones are established independently of the data**
- **zones may be used to present many types of data**

Choropleth maps

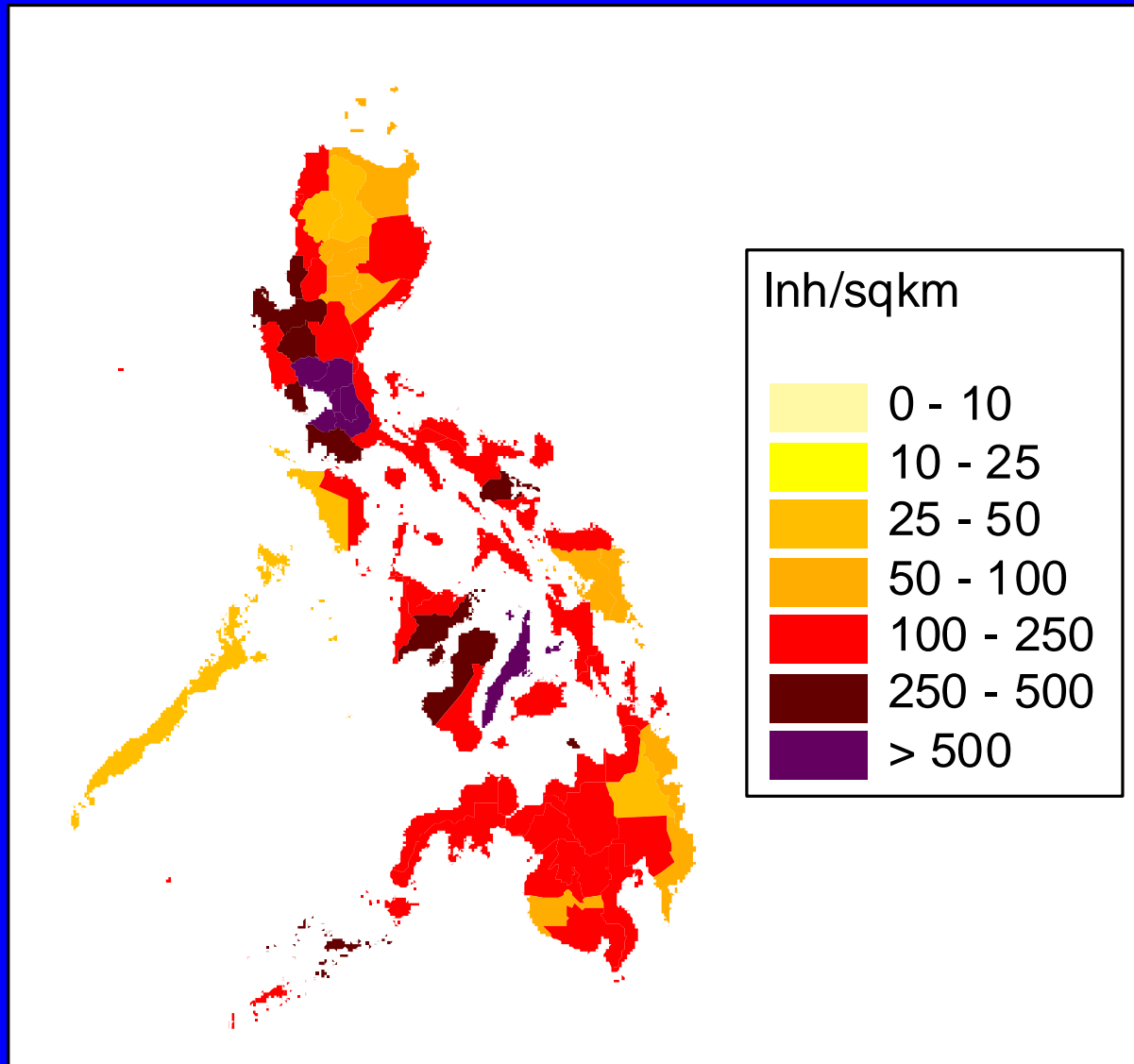


Population
Density



Total Fertility
Rate

Choropleth maps



Philippines
Population Density
by Province

Choropleth maps

- equal intervals

0 - 10

10 - 20

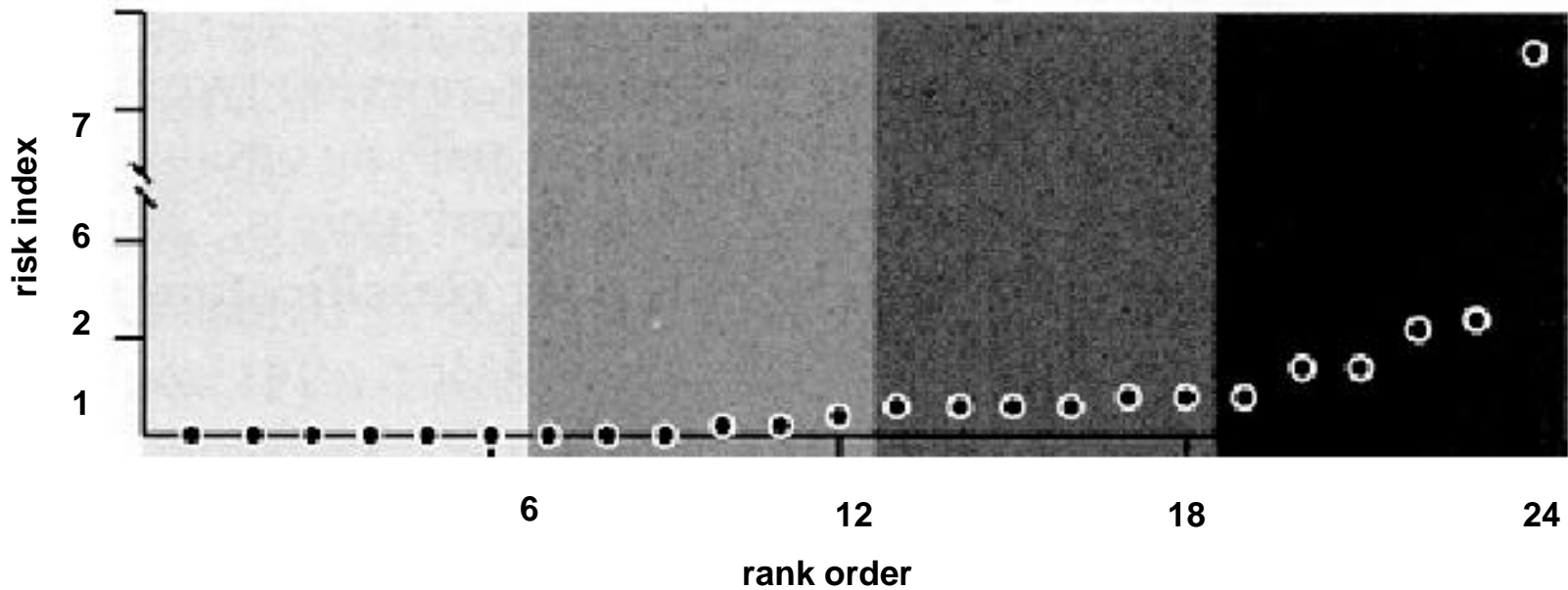
20 - 30

30 - 40

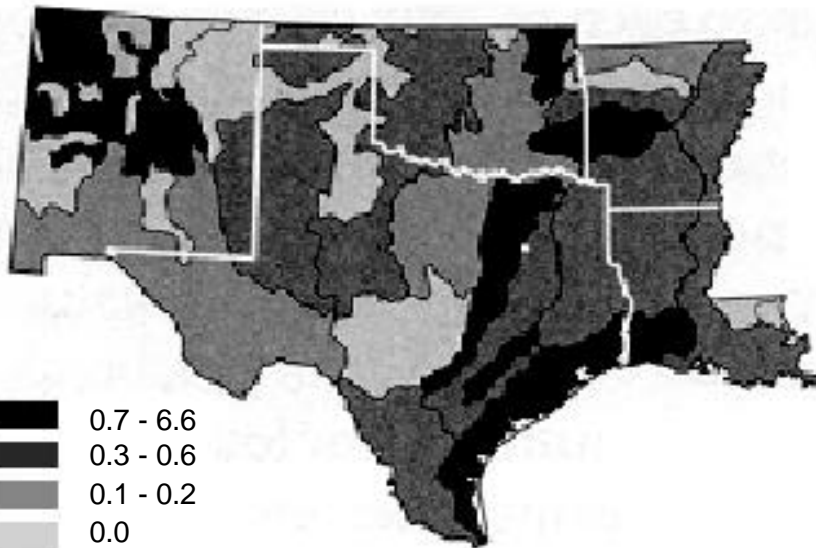
Choropleth maps

- **equal number of cases (quantile mapping)**
 - **same number of observations in each class**
 - **problem if there are many similar values -> cases with the same value may be put into different classes**

Problems with quantile mapping



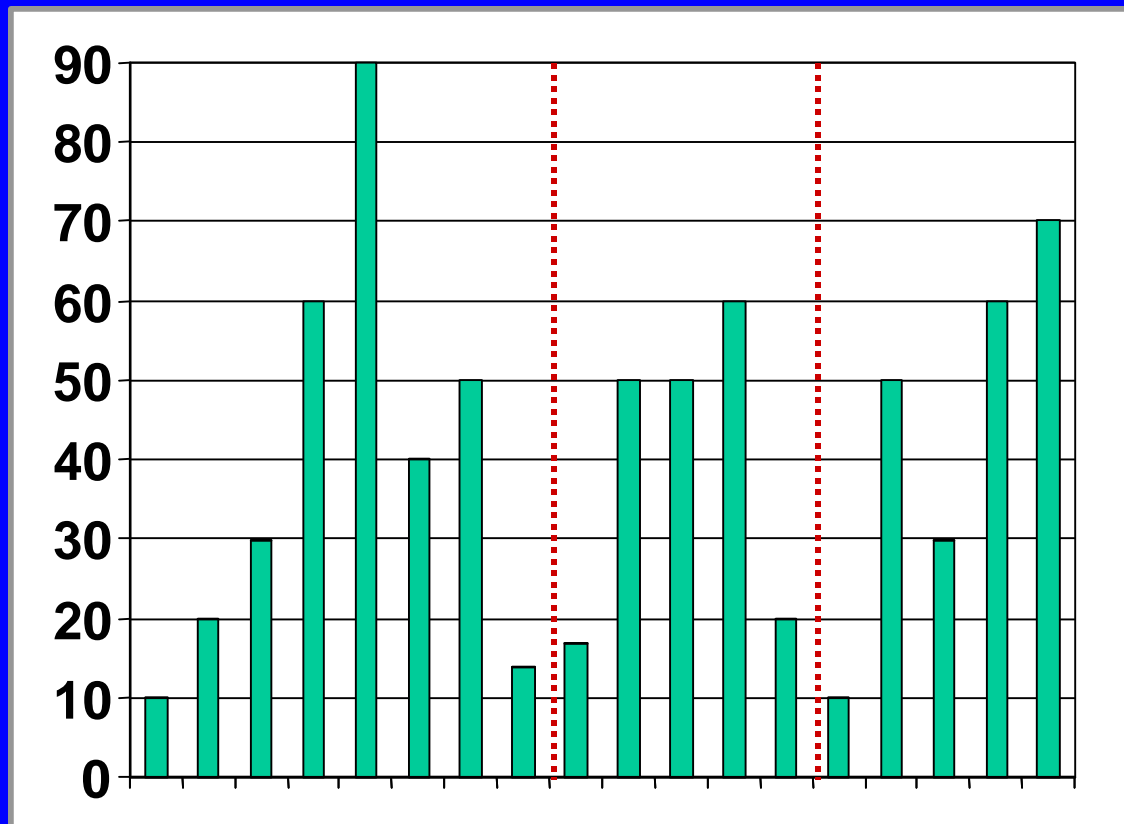
Risk index values in rank order with the resulting class break points indicated



Map of risk indices using adjusted quantile classes

Choropleth maps

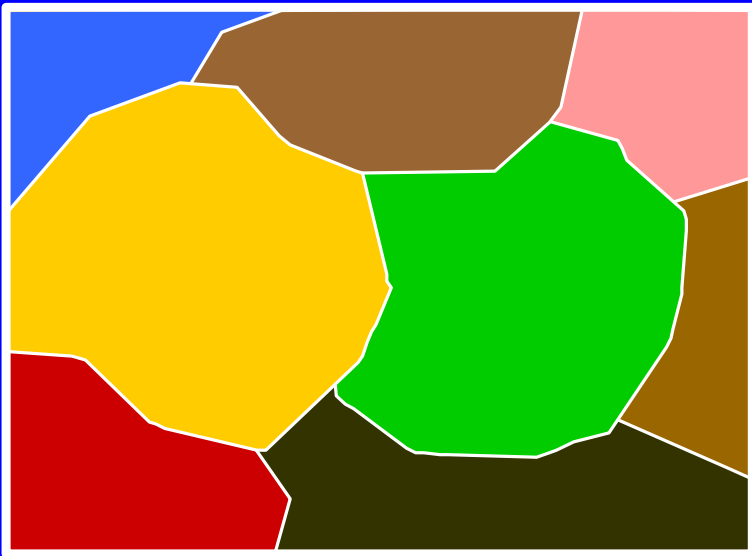
- often useful to plot a histogram of the data before determining class breaks



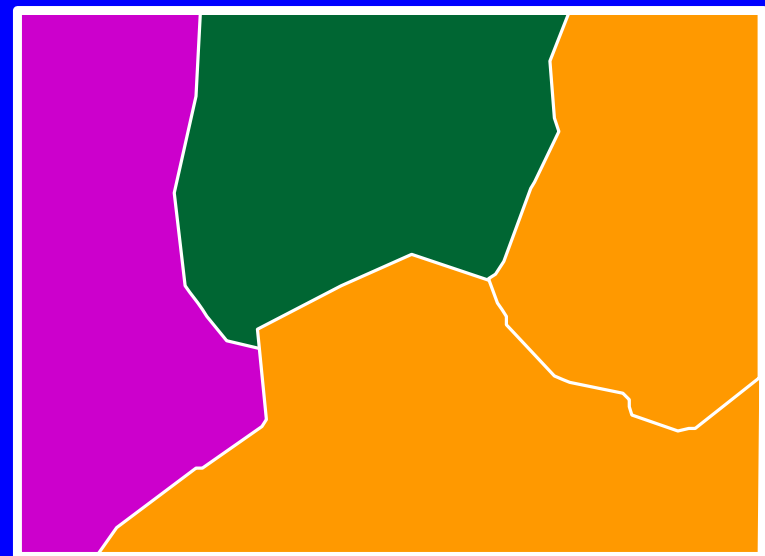
Area class maps

- shows zones of constant attributes such as vegetation or soil classes
- zones are different for each map because they are dependent on the feature mapped
- e.g., boundaries between vegetation types are different from those for soils

Area class maps



Soil Categories

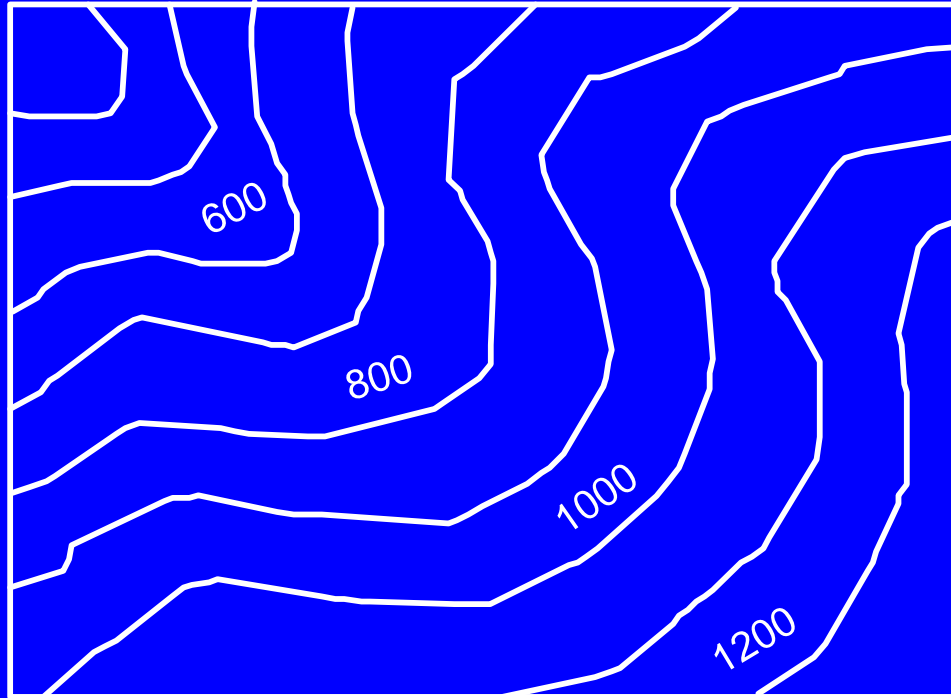


Vegetation Classes

Isopleth maps

- shows an imaginary surface by means of lines joining locations of constant value called **isolines**
e.g., elevation contours
- used for phenomena which vary smoothly such as temperature, pressure or sometimes population density

Isopleth map



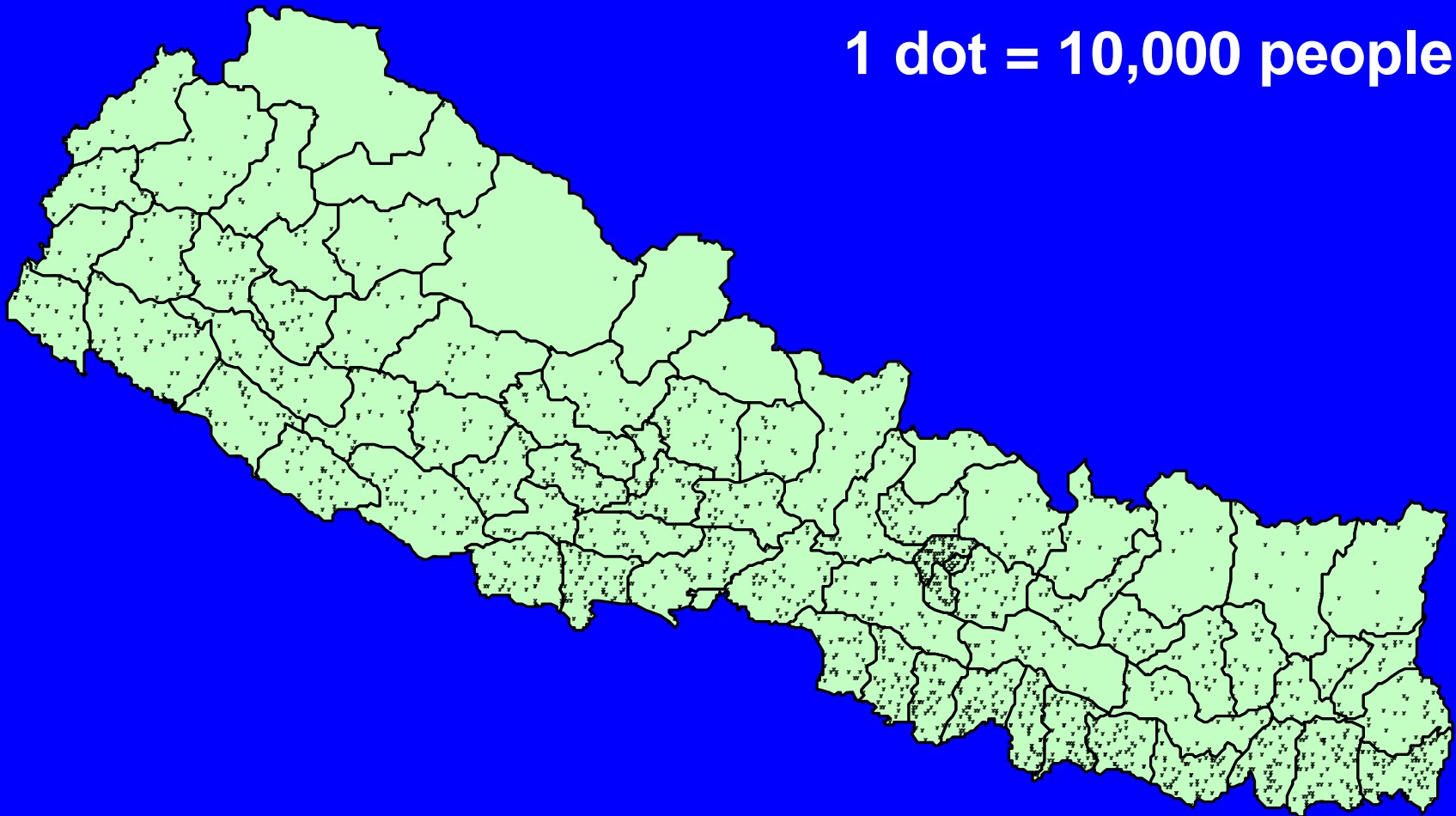
Mean annual
rainfall

Dot density maps

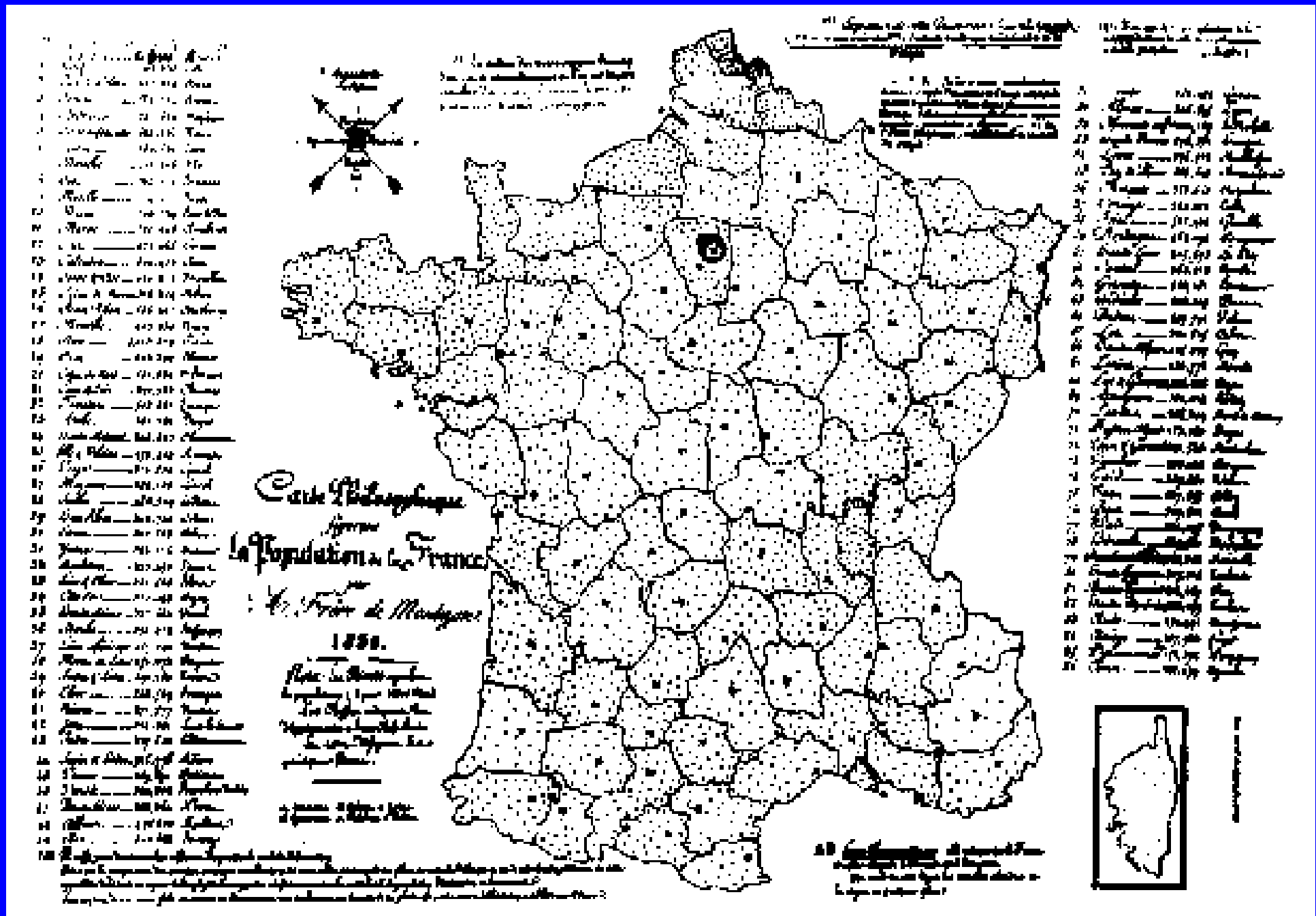
- **represents the magnitude of a variable by varying the density of dots within each area**
- **popular for population applications**
- **good for black/white publications (can be easily photocopied)**

Population Distribution in Nepal - 1991

1 dot = 10,000 people



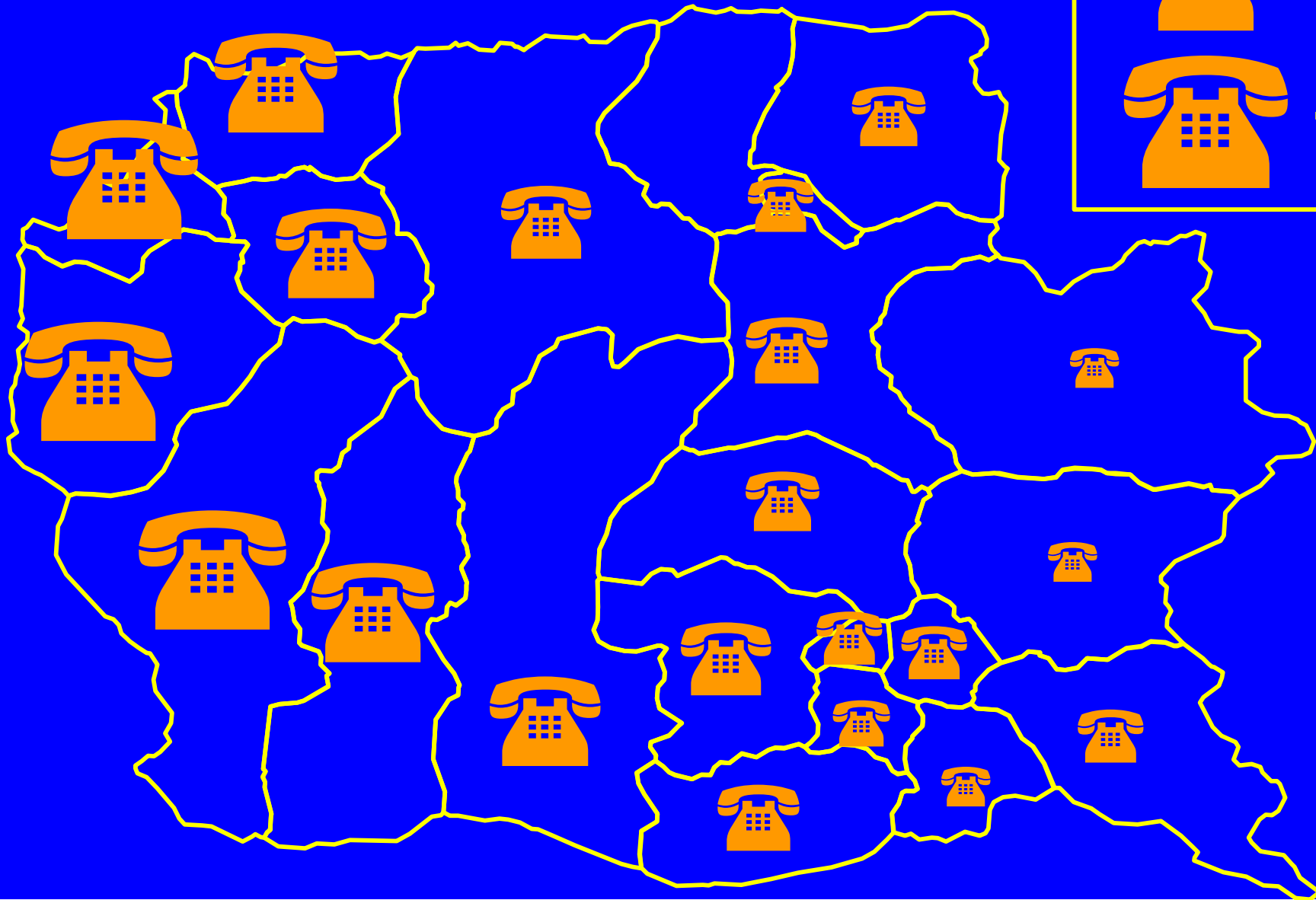
De Montizon's Population Dot Map of 1830



Graduated symbol maps

- **size of a symbol represents the magnitude of a variable**
- **often appropriate for socioeconomic variables**
- **can use a symbol or icon that represents the variable**

Number of telephones per 1000 people



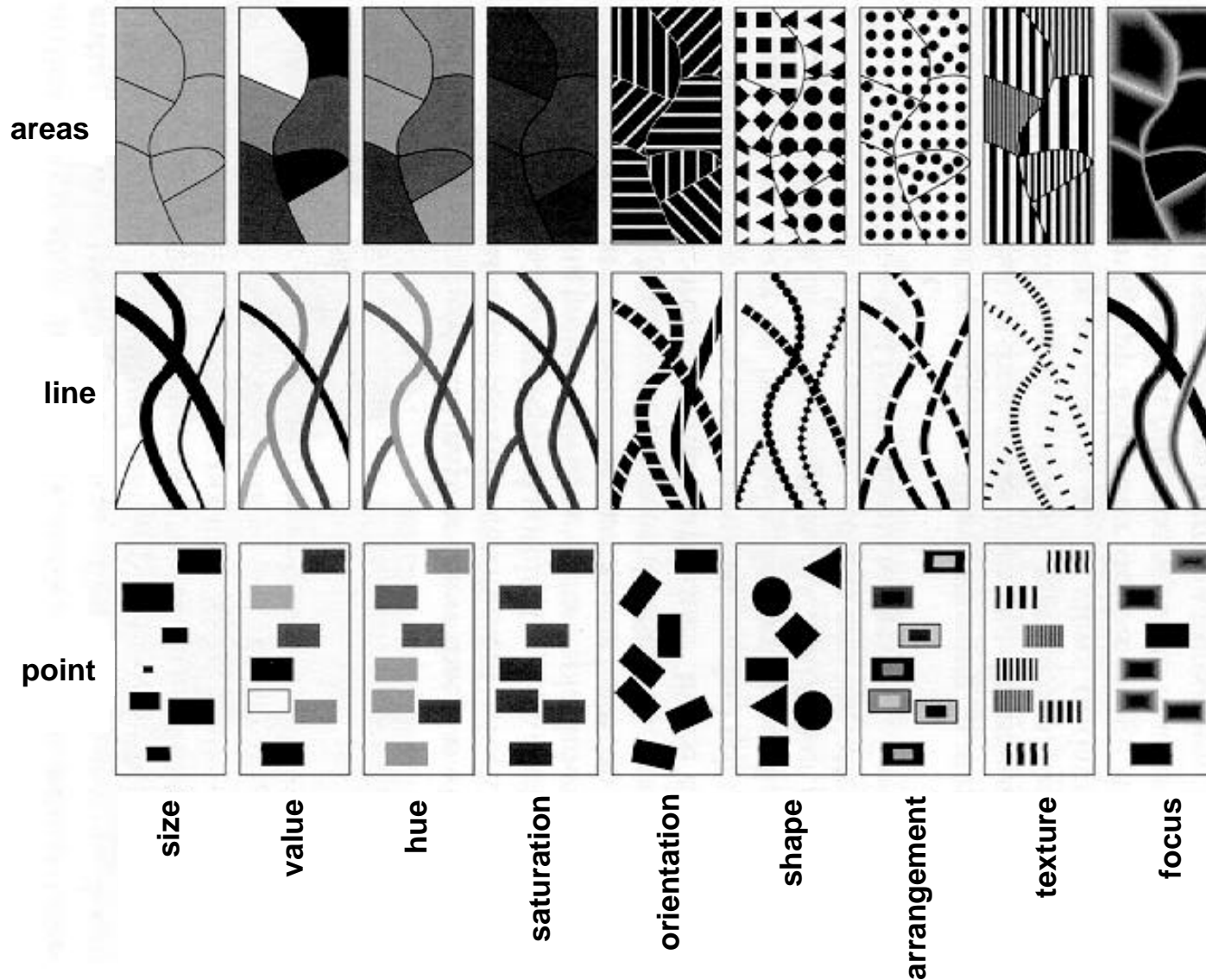
Flow maps

- **width of a bar or arrow is proportional to the corresponding flow**
- **direction shows from where to where the flow occurs**
- **few mapping packages implement this feature**

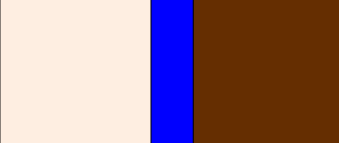
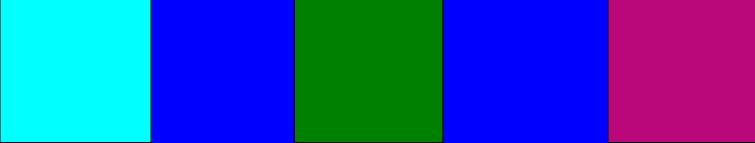
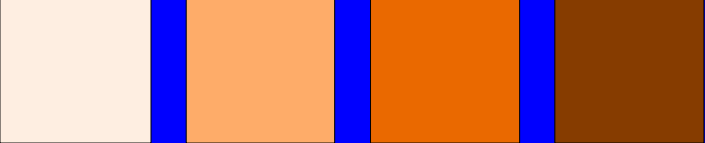
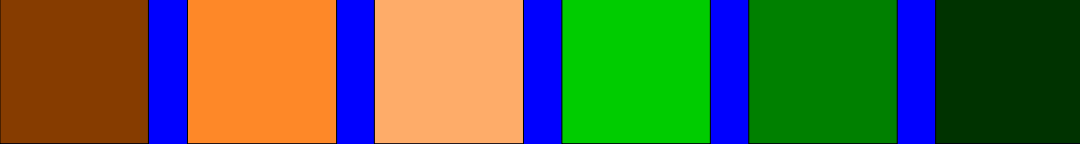
Thematic mapping

- **design issues**
- **data need to be represented correctly and in an easy-to-understand way**
- **choice of colors, symbols, fonts, etc. needs to be matched to the variable mapped**

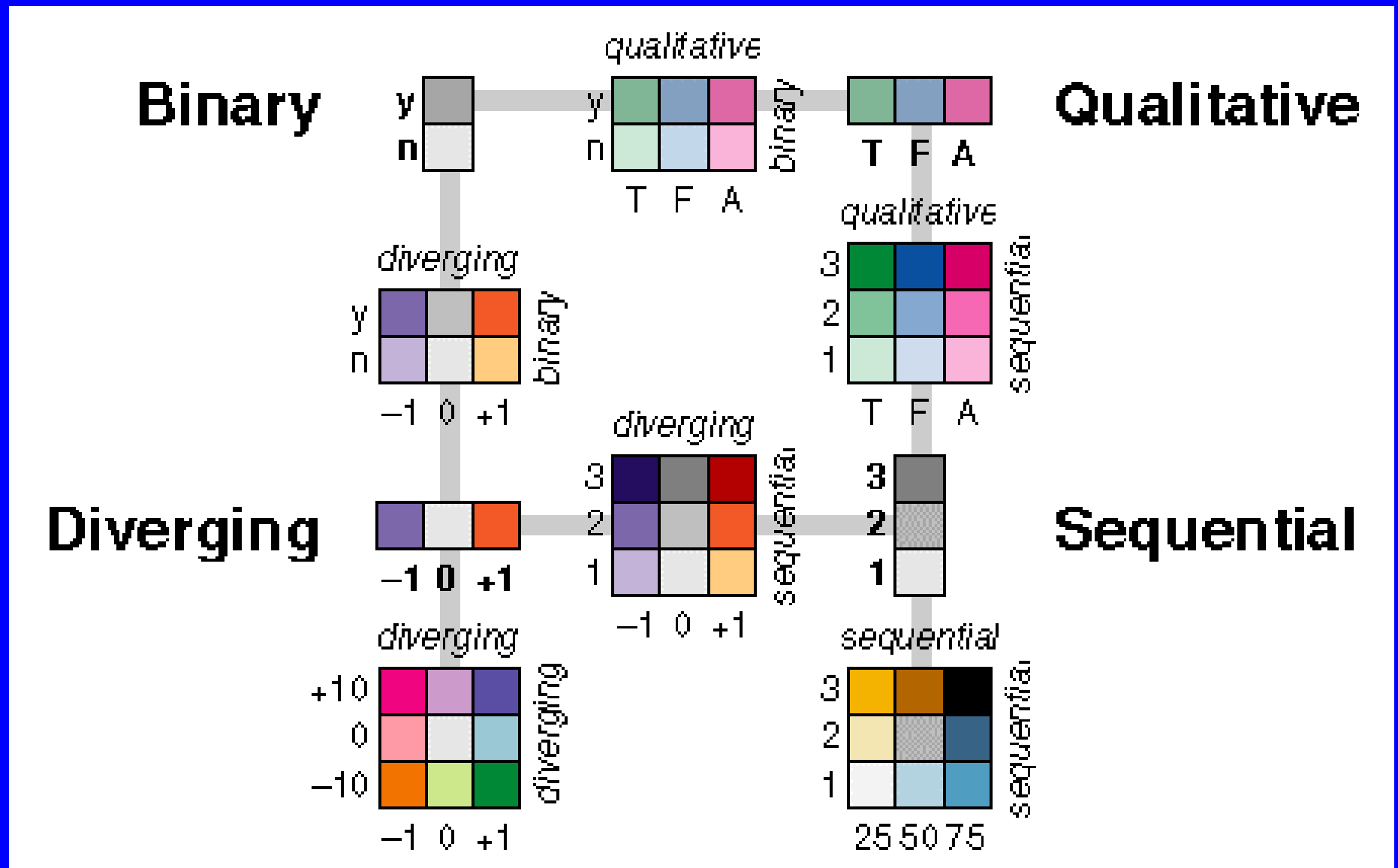
Graphic variables for points, lines and areas



Color scheme depends on the type of variable

- **binary**

yes no
- **qualitative**

Agric. Industry Services
- **sequential**

1 2 3 4
- **diverging**

-3 -2 -1 1 2 3

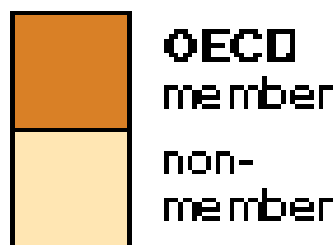
Color choice guidelines



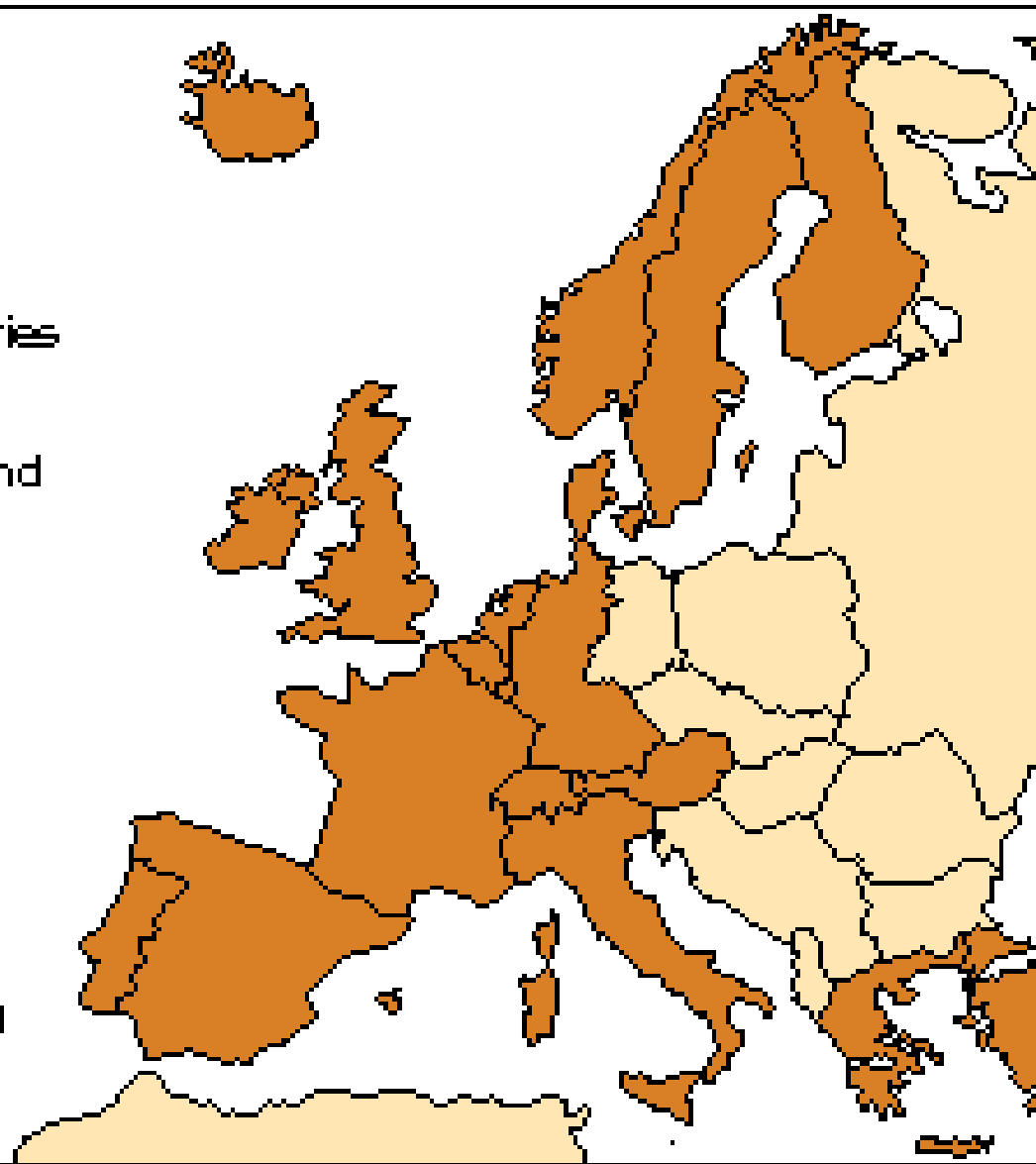
Source: Brewer (1994)

Binary Scheme

European Member Countries
of the
Organization for
Economic Cooperation and
Development, 1980



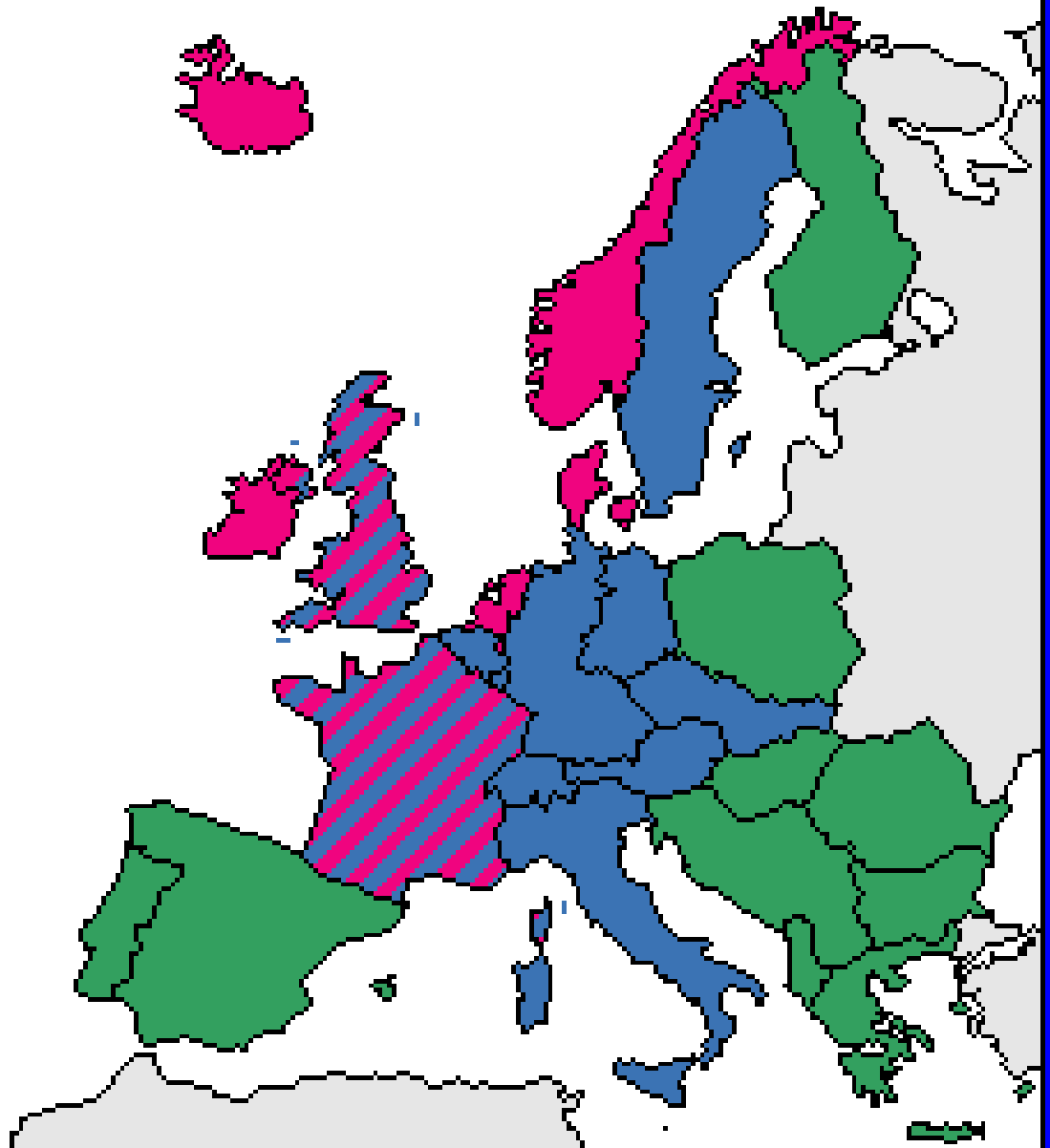
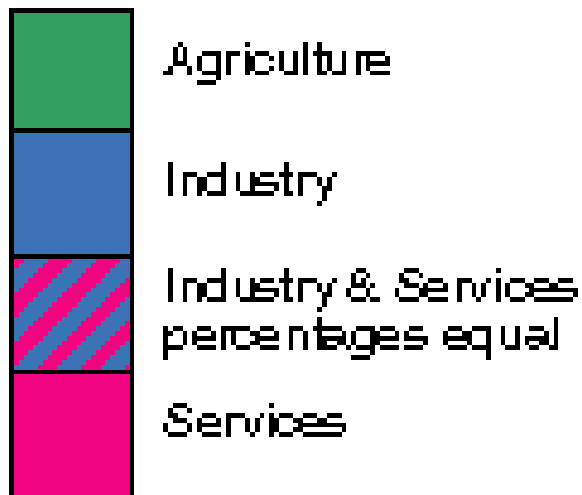
Remaining OECD Members:
Canada, United States,
Japan, Australia, New Zealand



Qualitative Scheme

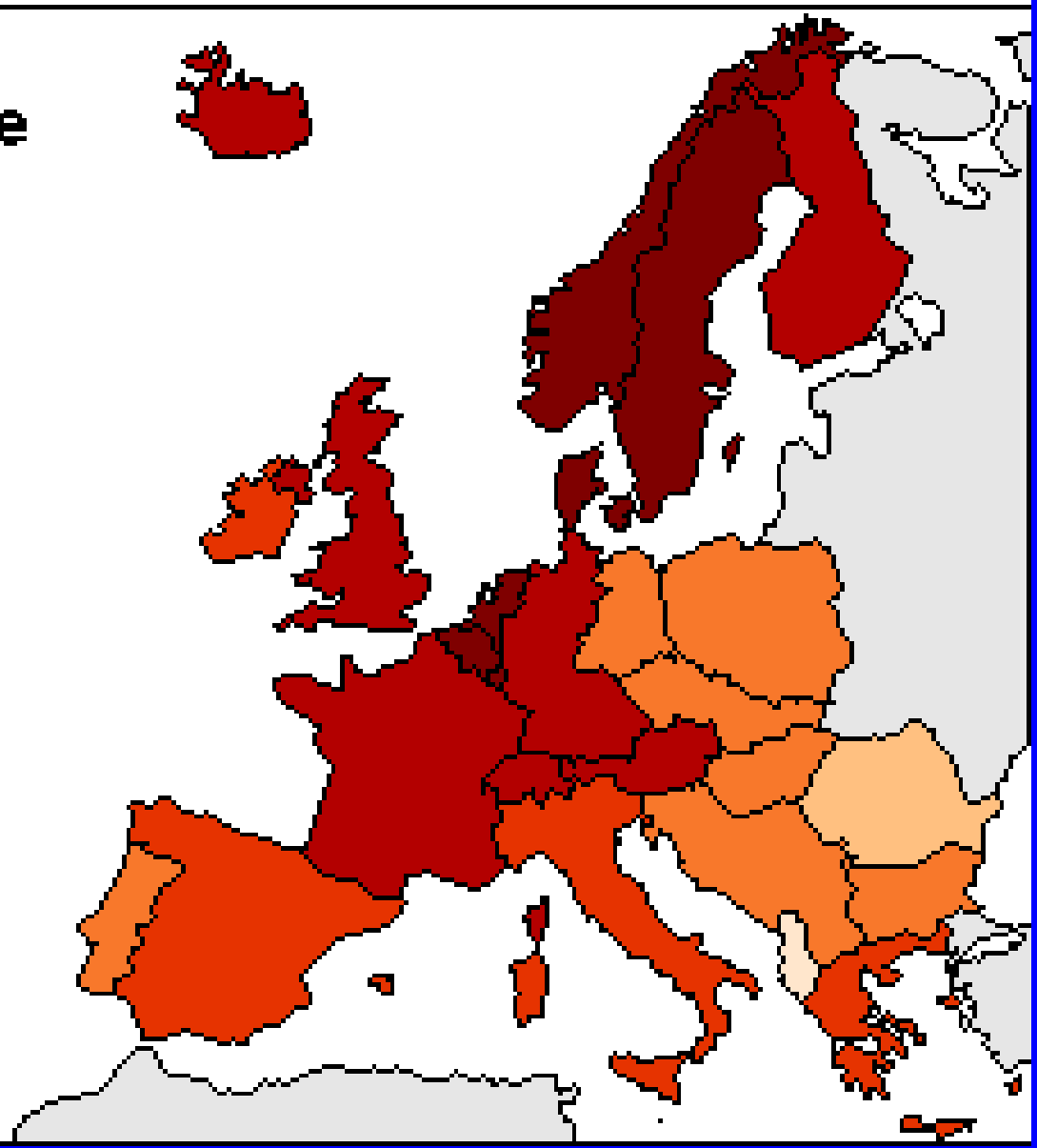
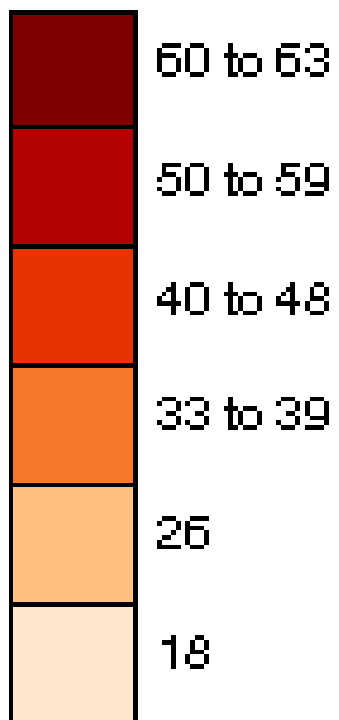
**Dominant sector,
1960**

Sector employing
largest percentage
of labor force



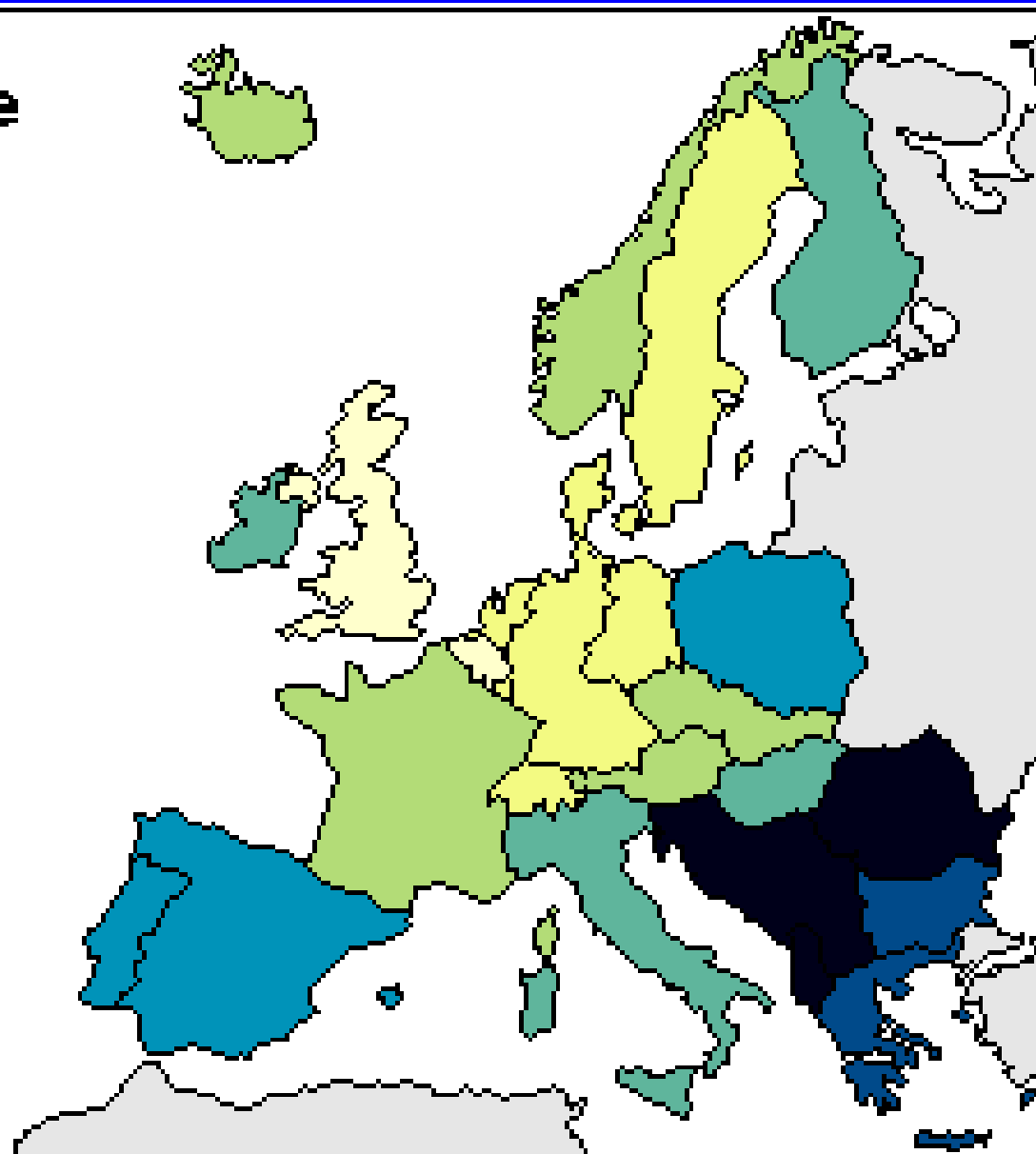
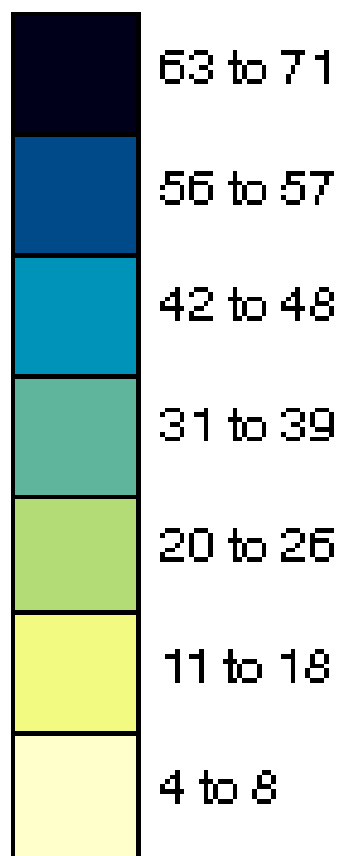
Sequential Scheme One Hue

Percent of
labor force
employed in
SERVICES
1980



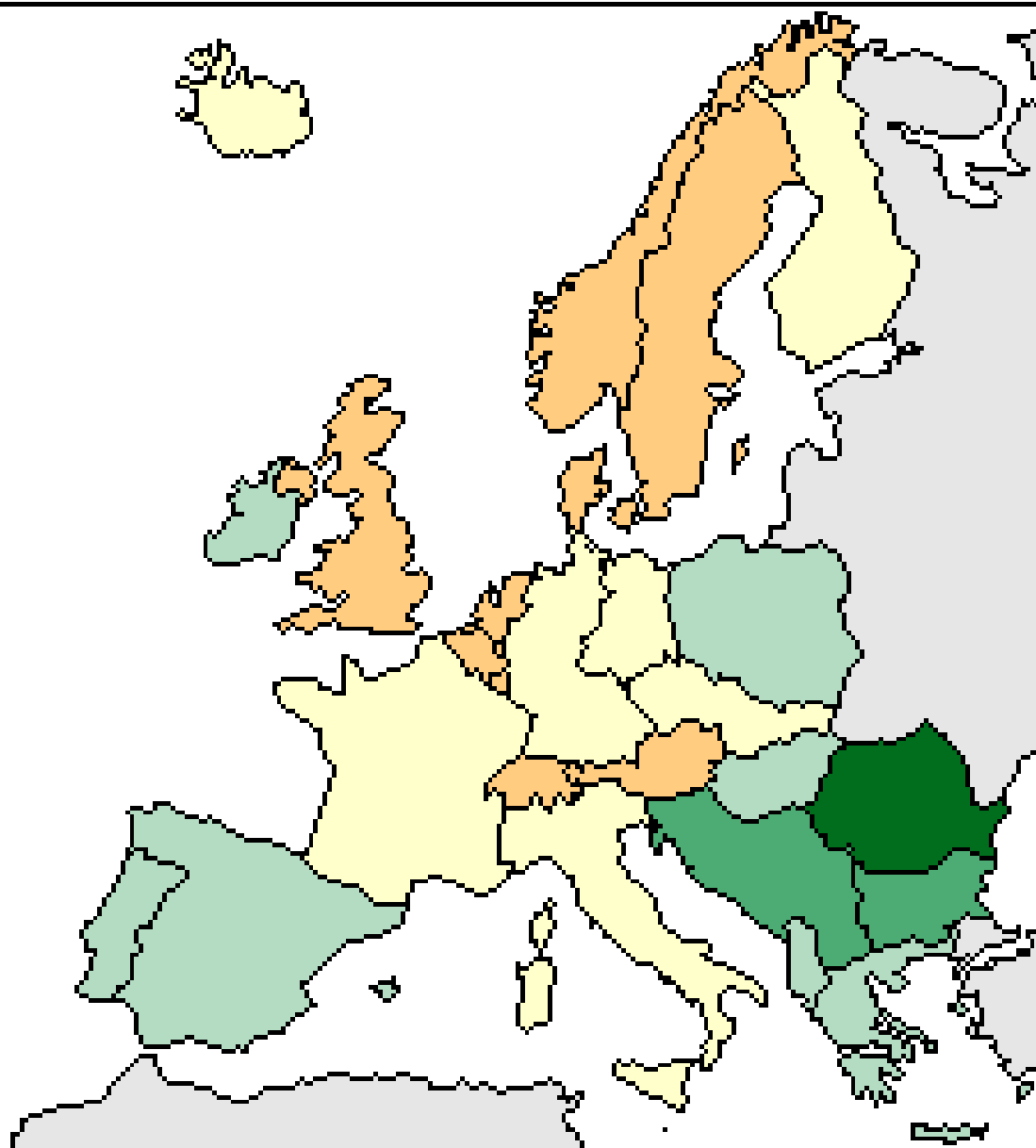
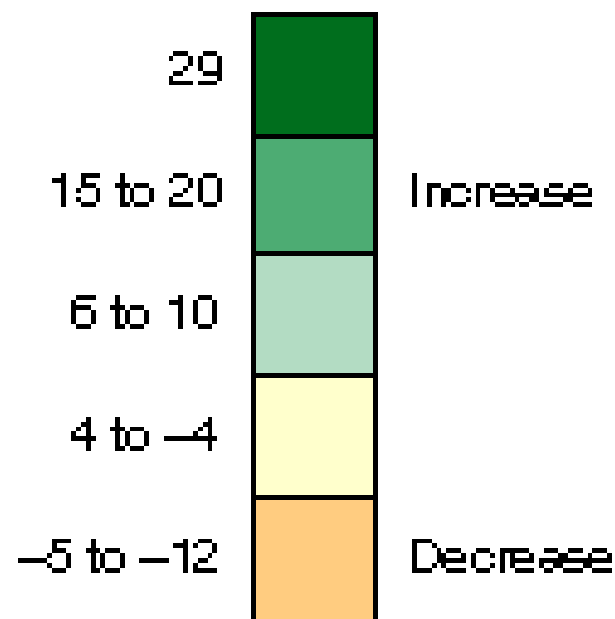
Sequential Scheme Hue Transition

Percent of
labor force
employed in
agriculture
1960

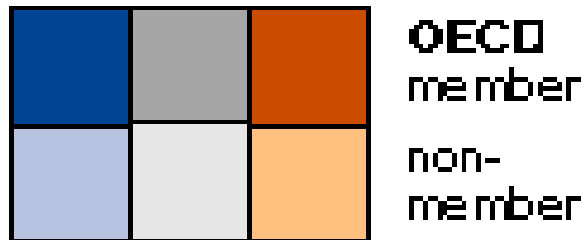


Diverging Scheme

Change in percent of labor force employed in **industry** between **1960 and 1980**

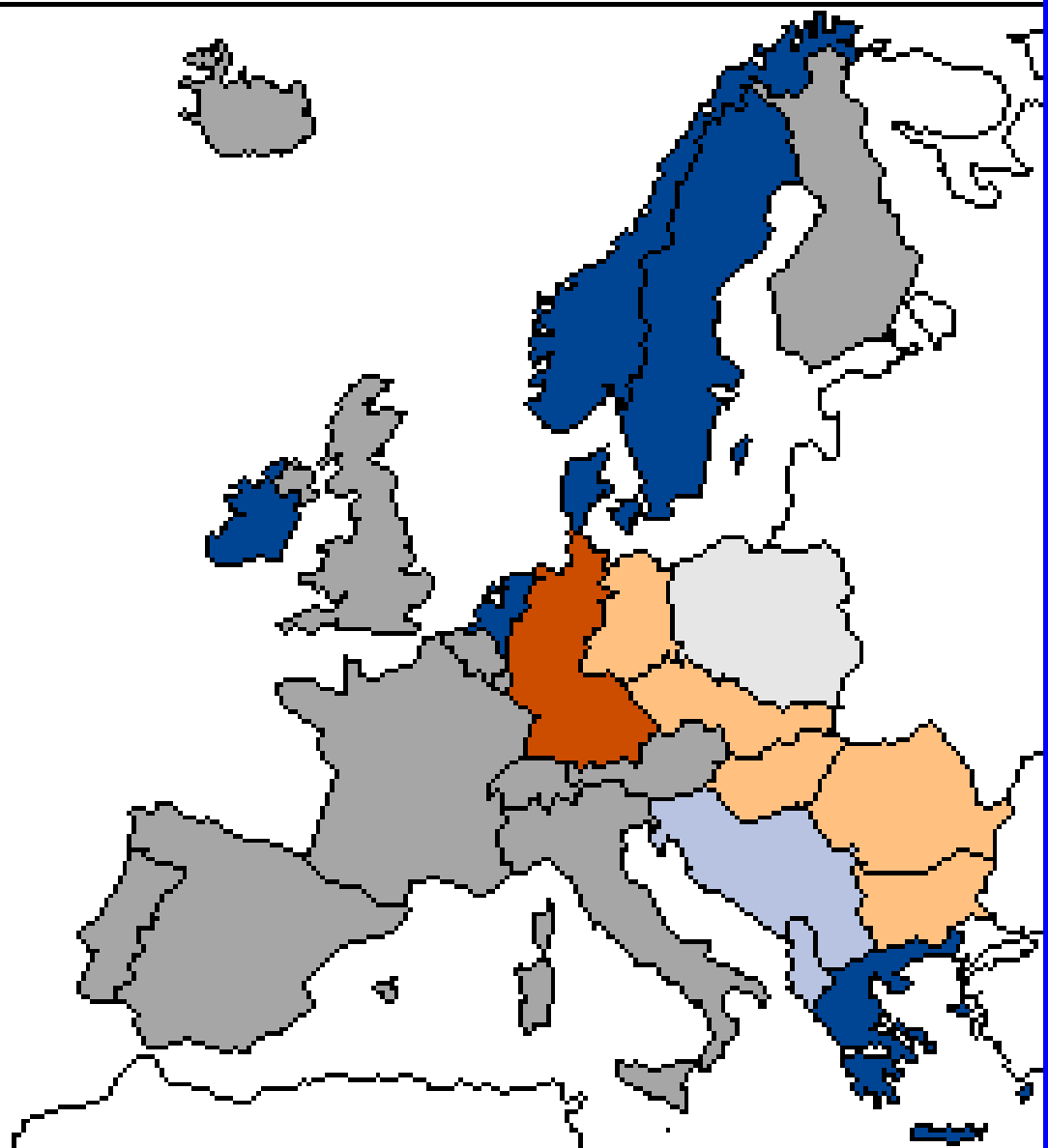


Diverging / Binary Scheme



≤ -5 -4 to 4 ≥ 5

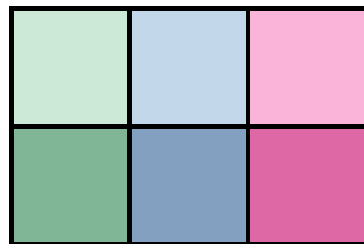
Difference between
percent of **country**
labor force employed
in **industry, 1980**
and
percent of **total European**
labor force employed
in **industry, 1980**



Qualitative / Binary Scheme

Sector employing **smallest** percentage of labor force in 1960

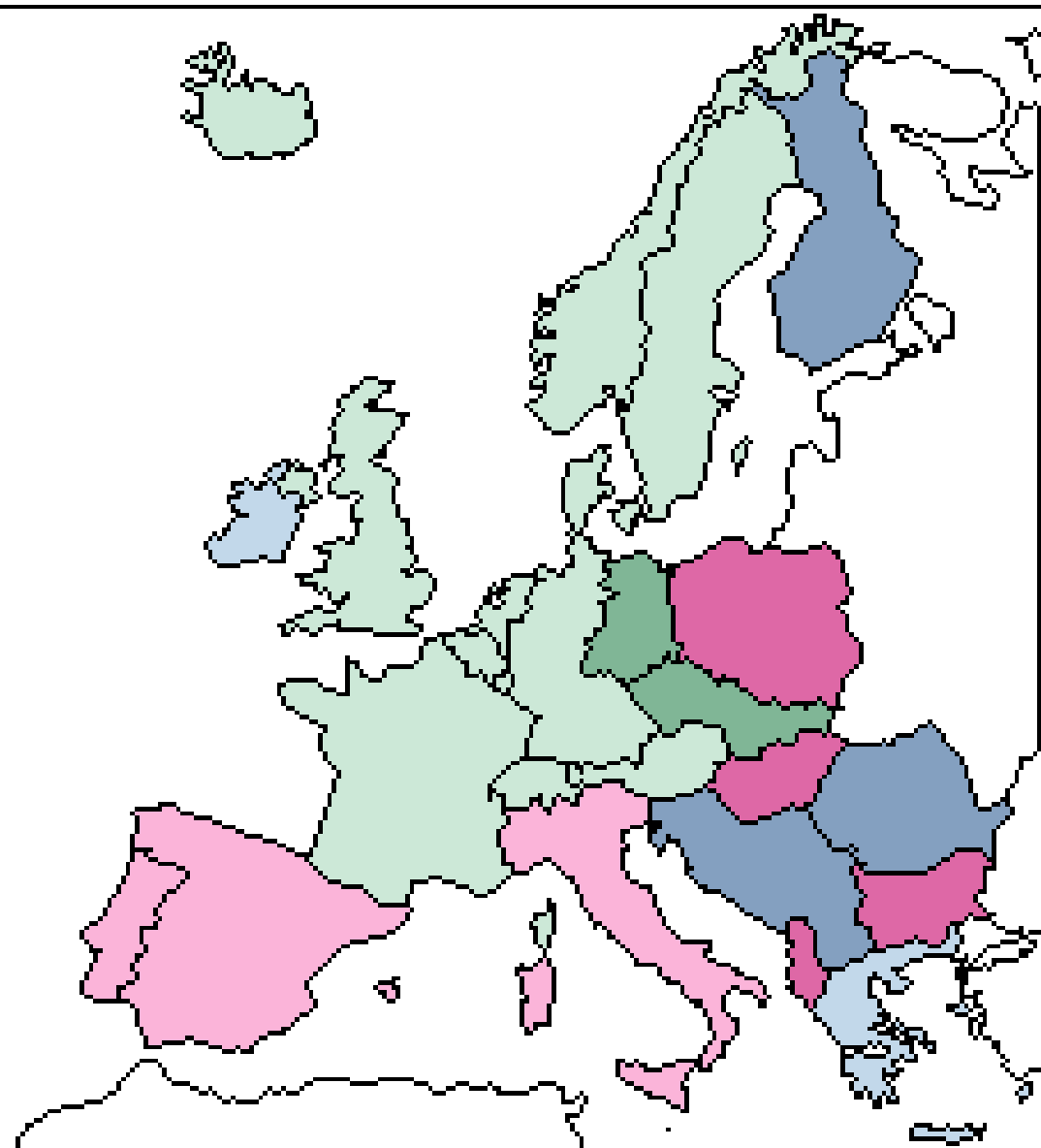
Agric. Ind. Serv.



OECD*
member

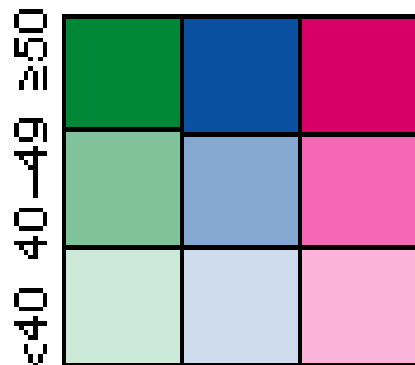
non-
member

* Organization for Economic Cooperation and Development was established in 1961 (Finland joined in 1969)



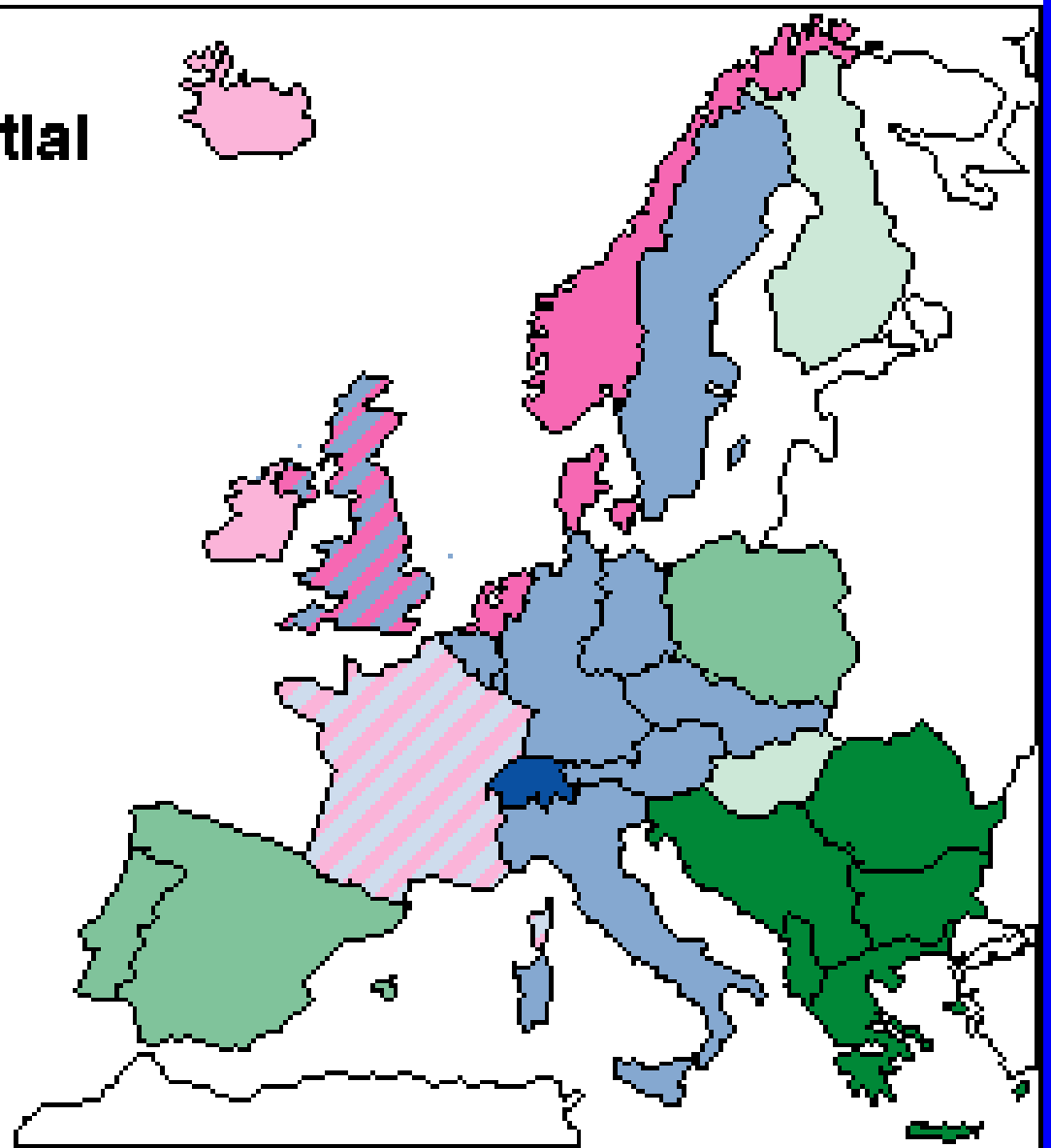
Qualitative / Sequential Scheme

Percent of labor force employed in dominant sector, 1960



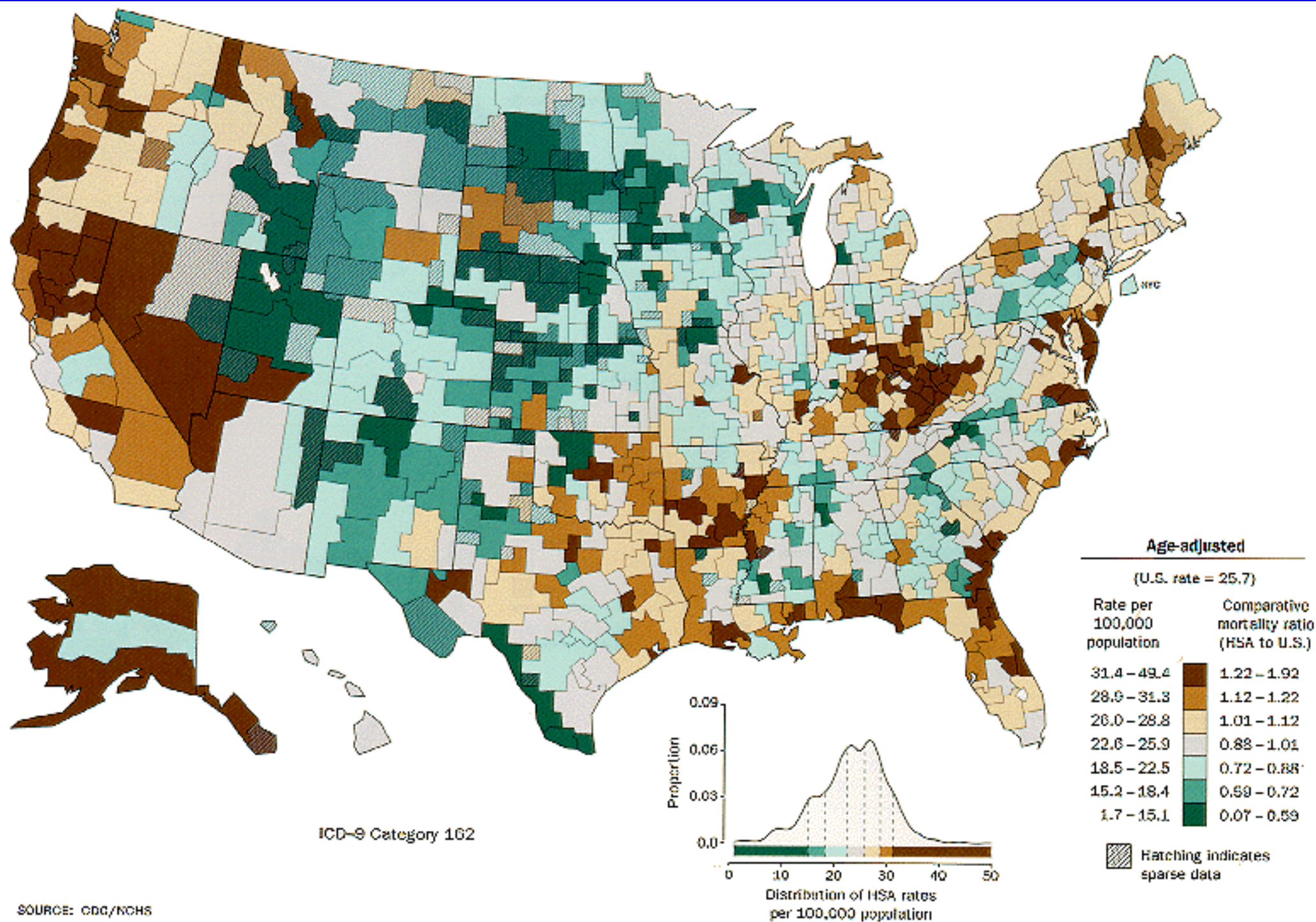
Agric. Ind. Serv.

Dominant sector 1960



Map design

- **often nice to add additional information**
 - **scale bar and north arrow**
 - **histogram or density plot showing data distribution**
 - **photographs or other images**



Map design

- **sometimes it is better to show several small maps, than one complex map**
- **“small multiples”: several small maps that tell a story**
- **map showing a cross-tabulation**

Map equivalent of a two-way table: two binary variables

