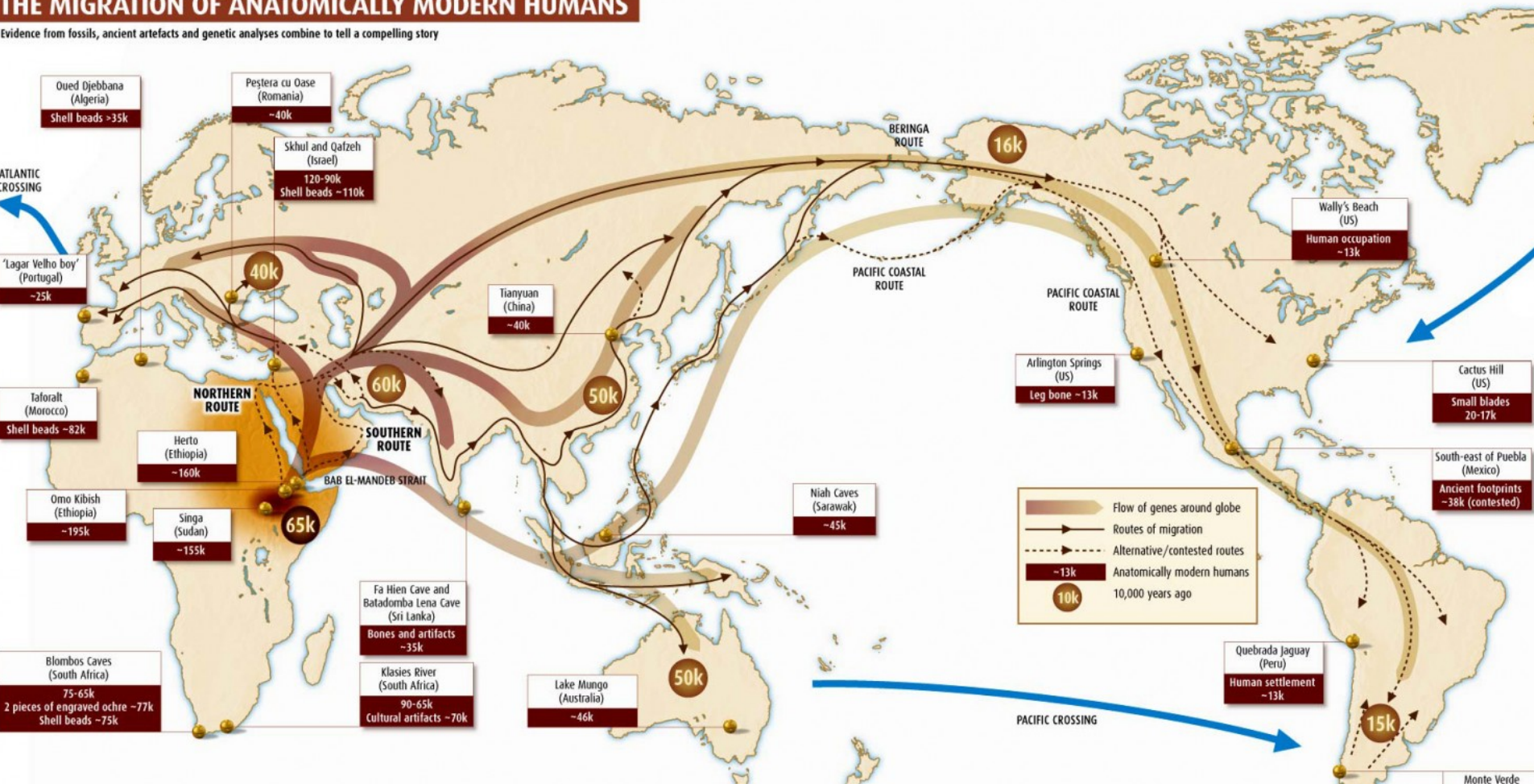


Map Projections & Scales

THE MIGRATION OF ANATOMICALLY MODERN HUMANS

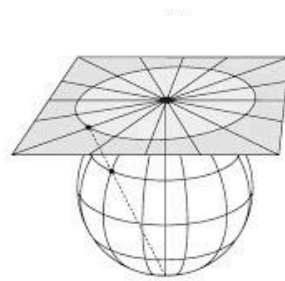
Evidence from fossils, ancient artefacts and genetic analyses combine to tell a compelling story



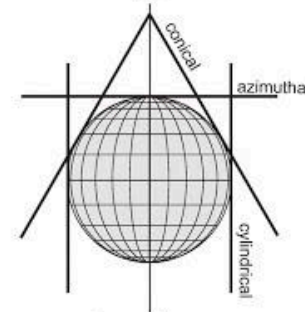
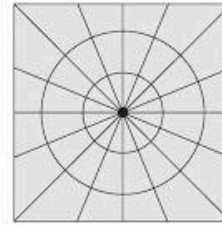
What is a map? A representation or abstraction of geographic reality.

(Board, 1990)

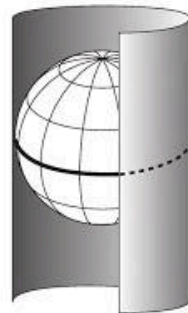
Which reality?



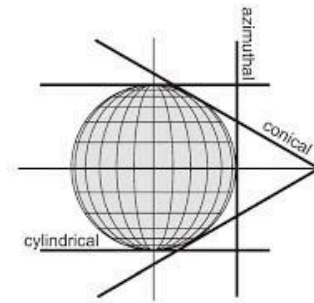
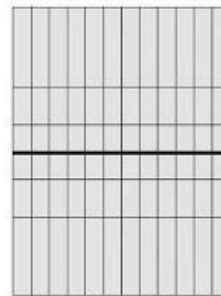
I azimuthal



I normal



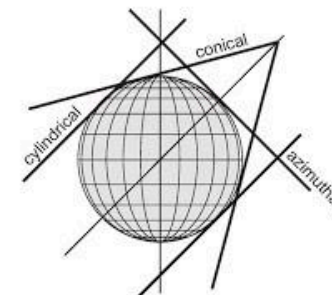
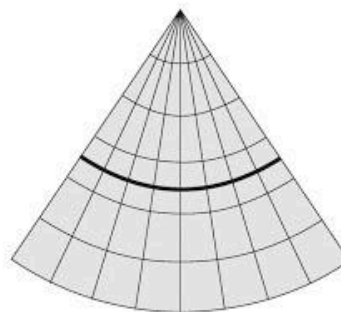
II cylindrical



II transverse



III conical



III oblique

Projection Distortion

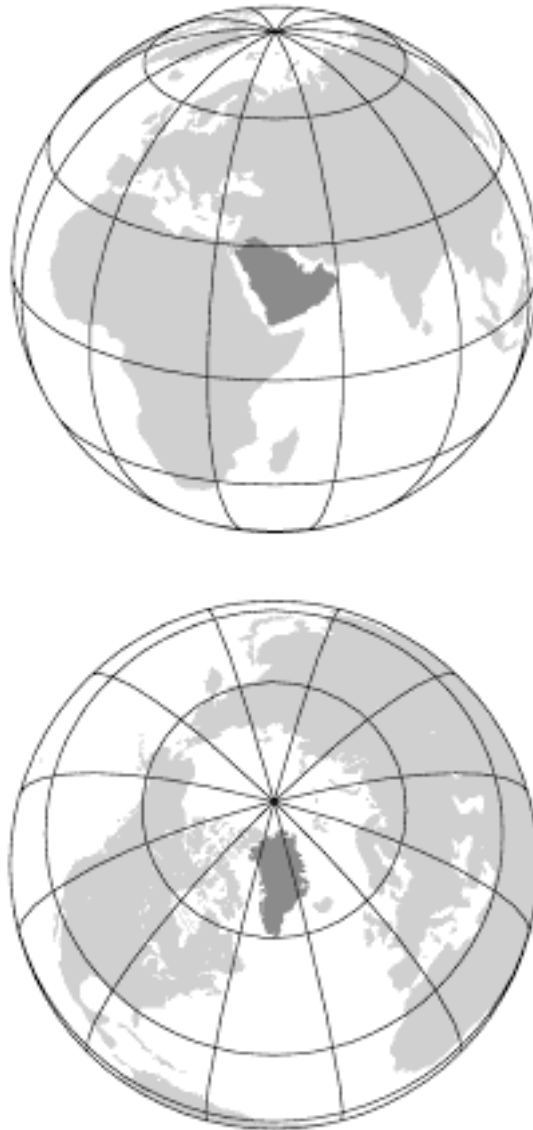
Characteristics

- Conformal: object shape preserved
- Equal-area: area sizes preserved
- Equidistant: distances between points preserved

Chamberlin Trimetric

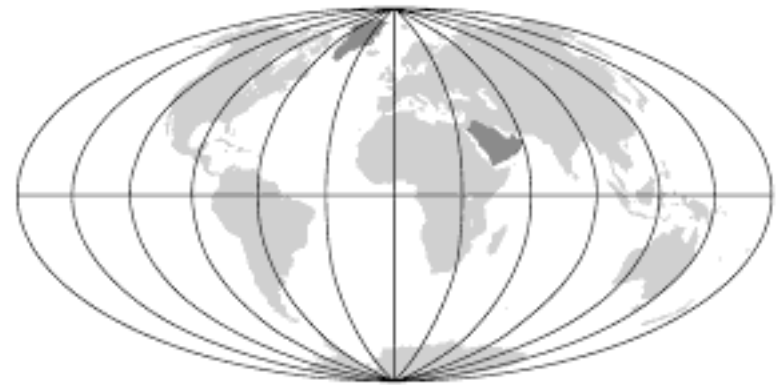


<http://bl.ocks.org/mbostock/5625053>



Kraak & Ormeling, 2010. *Cartography, third edition, visualization of spatial data.*

Mollweide Projection
pseudocylindrical, equal-area



Mercator Projection
cylindrical, conformal



WHAT YOUR FAVORITE
MAP PROJECTION
SAYS ABOUT YOU

MERCATOR

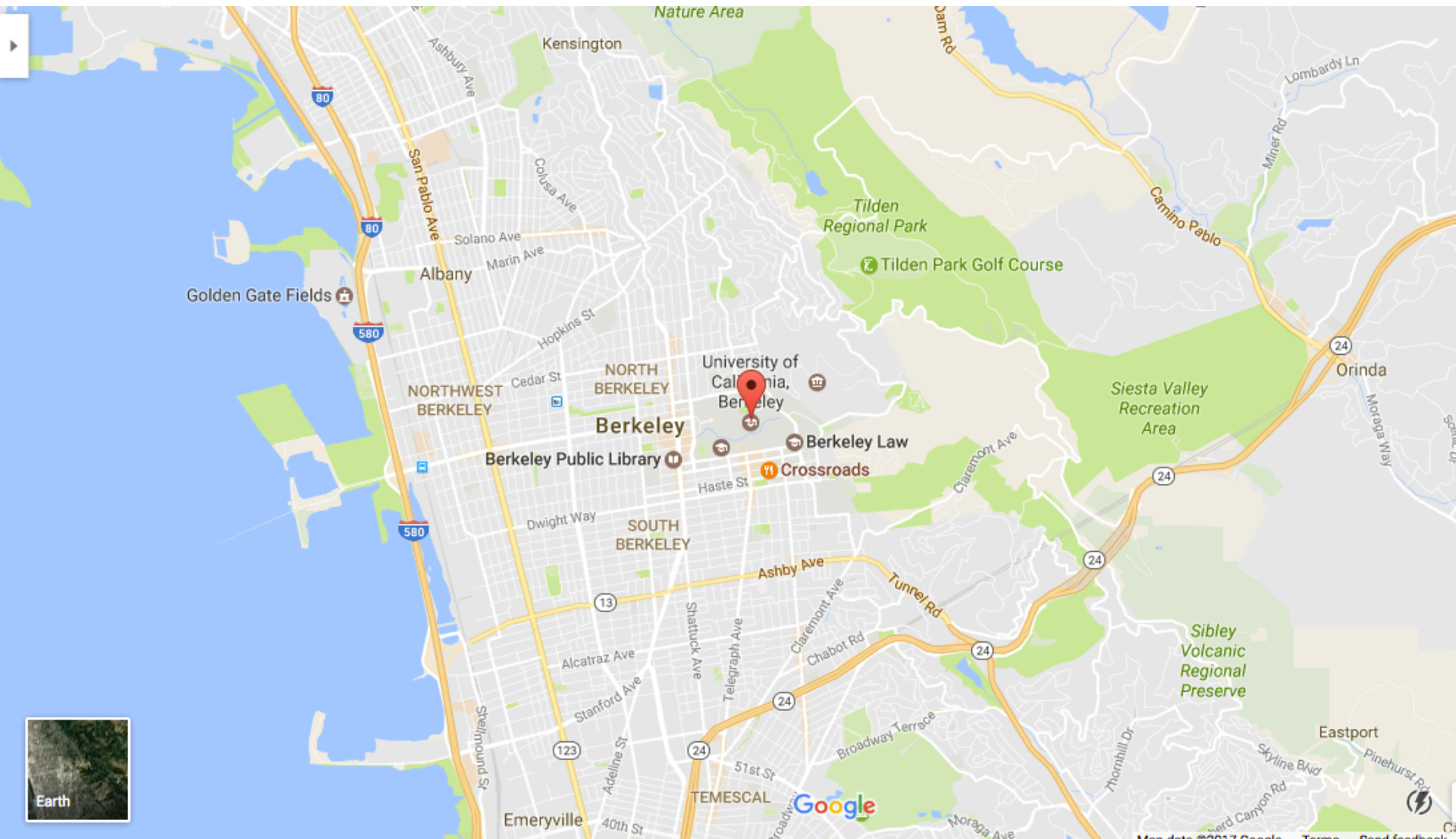


YOU'RE NOT REALLY INTO MAPS.

VAN DER GRINTEN



YOU'RE NOT A COMPLICATED PERSON. YOU LOVE THE MERCATOR PROJECTION; YOU JUST WISH IT WEREN'T SQUARE. THE EARTH'S NOT A SQUARE, IT'S A CIRCLE. YOU LIKE CIRCLES. TODAY IS GONNA BE A GOOD DAY!



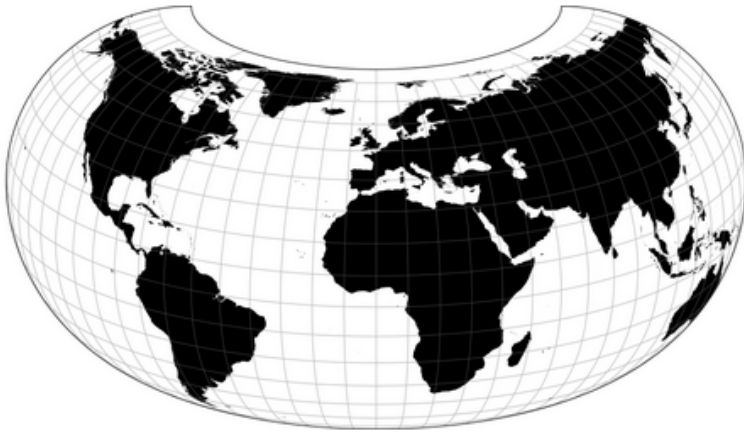
Google Maps API Custom Projection

```
<script>
  // This example defines an image map type using the Gall-Peters
  // projection.
  // https://en.wikipedia.org/wiki/Gall%E2%80%93Peters_projection

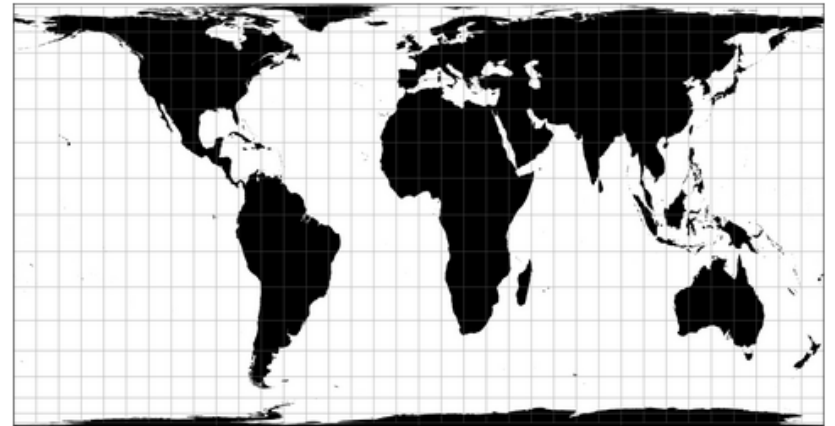
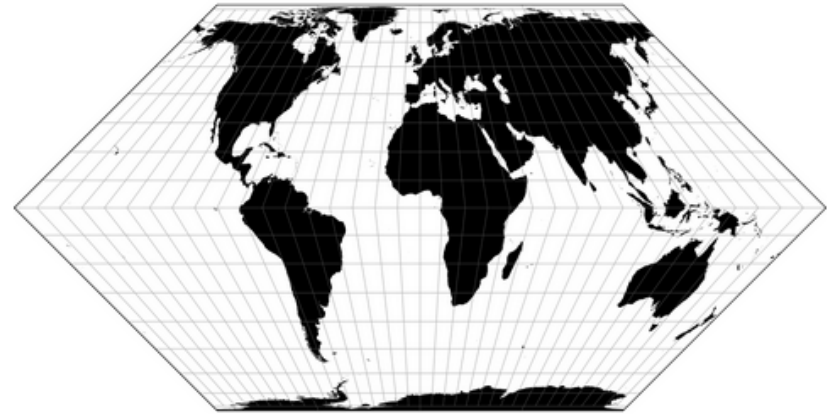
  function initMap() {
    // Create a map. Use the Gall-Peters map type.
    var map = new google.maps.Map(document.getElementById('map'), {
      zoom: 0,
      center: {lat: 0, lng: 0},
      mapTypeControl: false
    });

    initGallPeters();
    map.mapTypes.set('gallPeters', gallPetersMapType);
    map.setMapTypeId('gallPeters');
```

<https://developers.google.com/maps/documentation/javascript/examples/map-projection-simple>



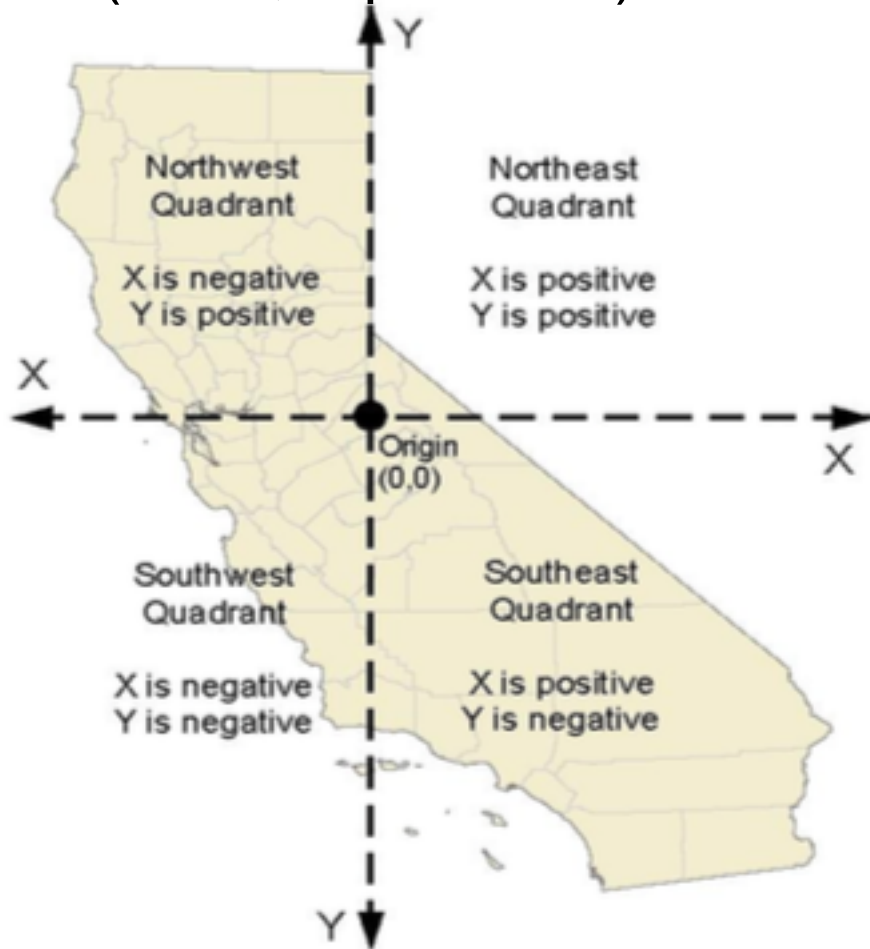
?



Data Examples

- flow patterns: conformal
- coverage, size of countries, proportional symbol, dot maps: equal-area
- navigational maps: equidistant

California Albers (conic, equal-area)



Web Mercator

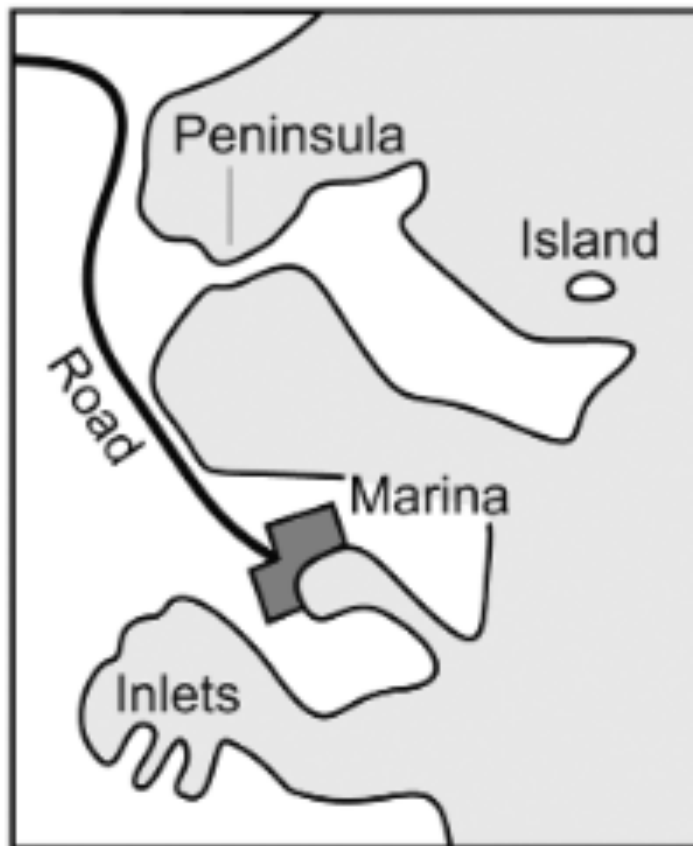


Scales & Generalization

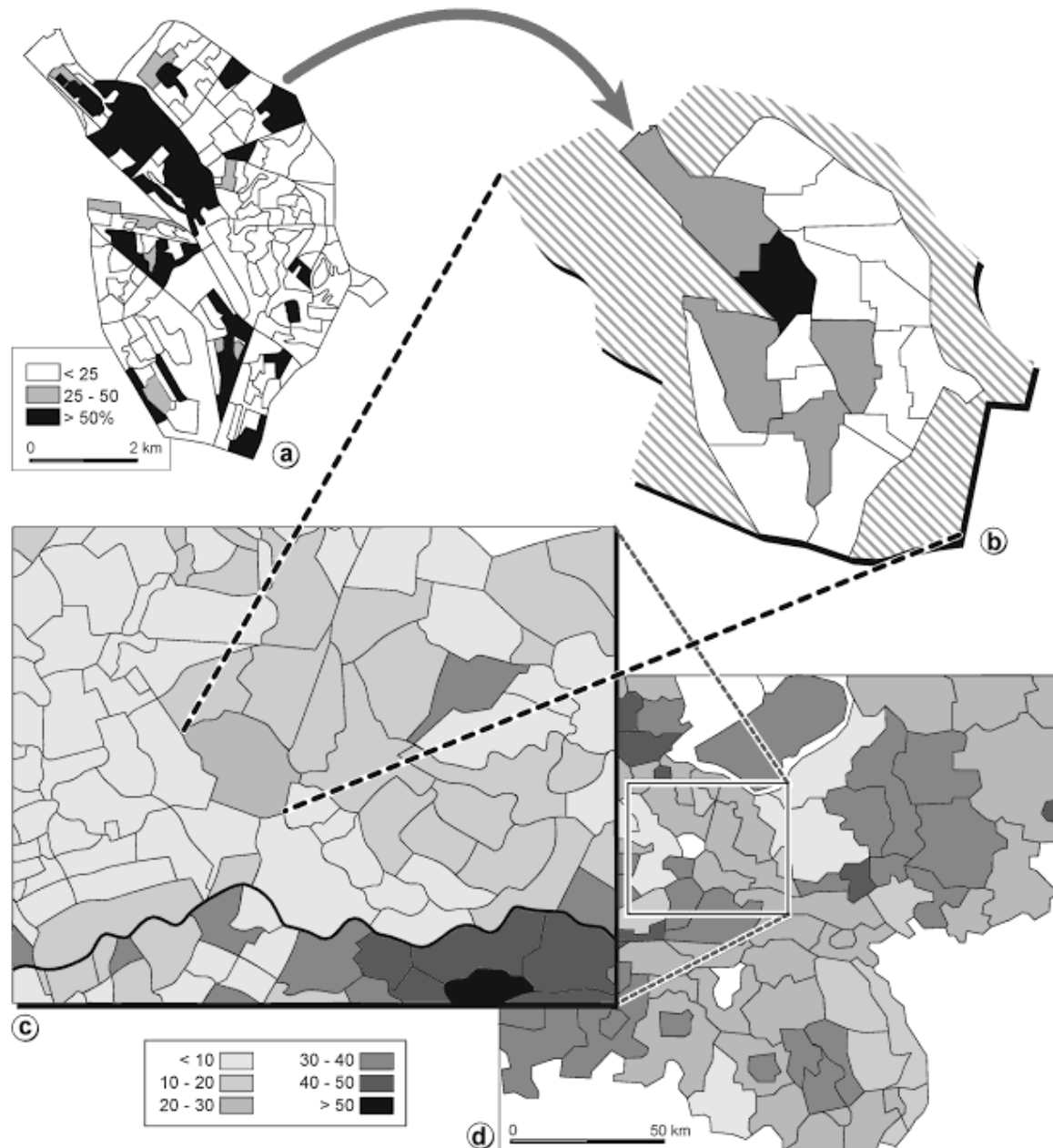


Kraak & Ormeling, 2010. *Cartography, third edition, visualization of spatial data.*

Geometry/Display Modifications



Brewer & Battenfield, 2007



Kraak & Ormeling, 2010. *Cartography, third edition, visualization of spatial data.*

Berkeley SCHOOL OF
INFORMATION