Introduction to spatial and spatiotemporal data in Python

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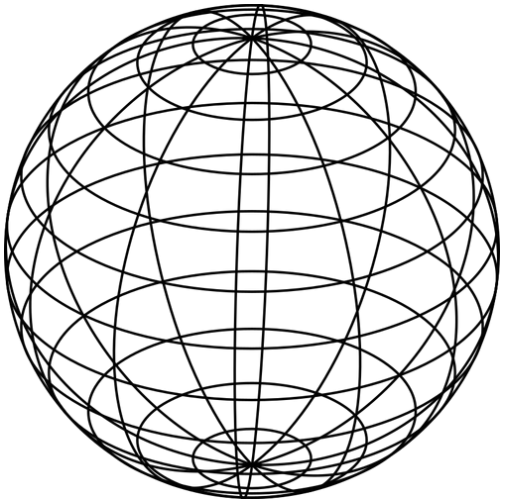
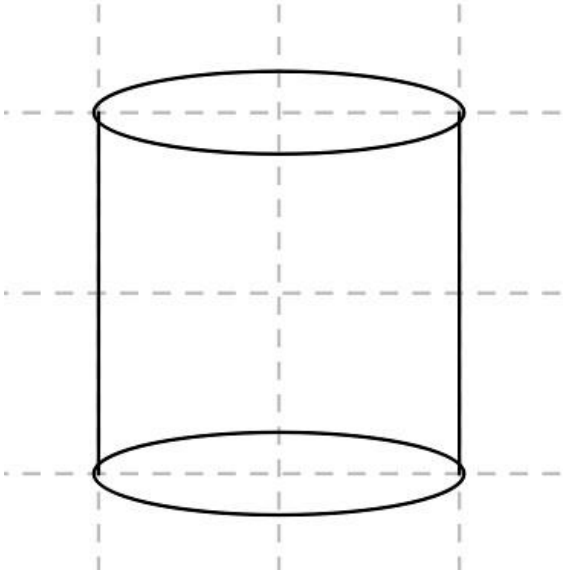
Introduction to spatial and spatiotemporal data in Python - Outline

- spatial referencing basics
- raster I/O and manipulation
- vector I/O and manipulation
- computing with basic time series
- eumap convenience and performance utilities

Spatial referencing basics

- spatial data = data in a spatial context
- what is spatial context?





Spatial referencing basics

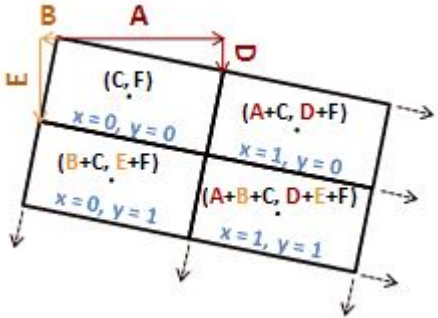
- to put data in a spatial context we need a spatial reference system (CRS)
- what does a CRS consist of?
  - ellipsoid
  - reference frame
  - projection surface
  - ...

Spatial referencing basics

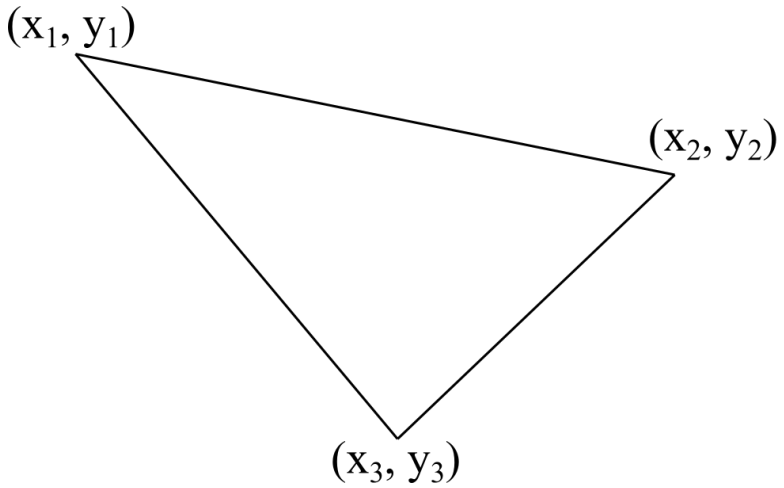
- rasters are positioned within the projected CRS with an affine transformation

$$y' = Ax + By + C$$

$$y' = Dx + Ey + C$$



- vectors contain the coordinates of each vertex



Spatial referencing basics

- x and y coordinates in the context of geospatial data typically refer to the projection surface
- the quality of a given CRS largely depends on the application (and the spatial scale of the data), e.g.
  - topographic maps - conformal projections
  - quantifying surface properties - equal area projections
- why does this matter?

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- and now for the practical part...