

FALL 2018



APPLIED ENGINEERING DATA ANALYSIS, OPTIMIZATION AND VISUALIZATION

GIS in R, 2

JOSHUA RHODES, PHD

Research Fellow/Adjunct Professor, The University of Texas at Austin

There are two basic ways to store GIS data

- Vector format
 - Points, lines, polygons
 - Cities, roads, counties
- Raster format
 - Images
 - Elevation over an area

Vector data

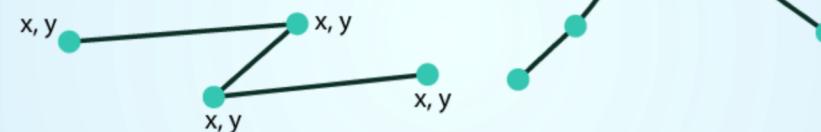
POINTS: Individual **x, y** locations.

ex: Center point of plot locations, tower locations, sampling locations.



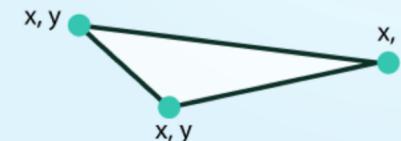
LINES: Composed of many (at least 2) vertices, or points, that are connected.

ex: Roads and streams.



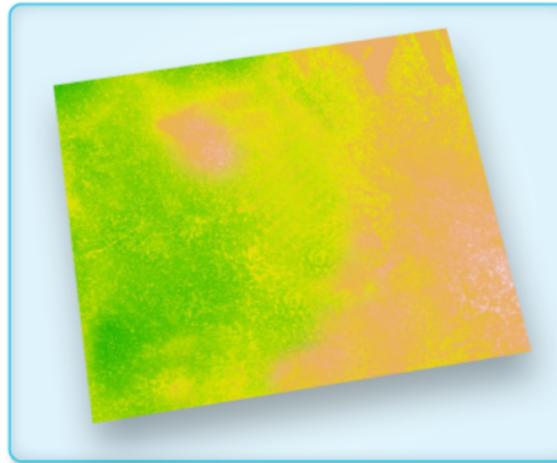
POLYGONS: 3 or more vertices that are connected and **closed**.

ex: Building boundaries and lakes.

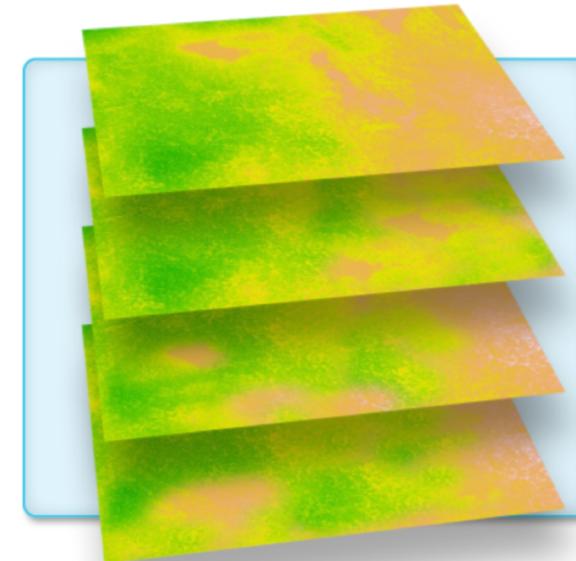


Today we will work with raster data

Single Band Raster

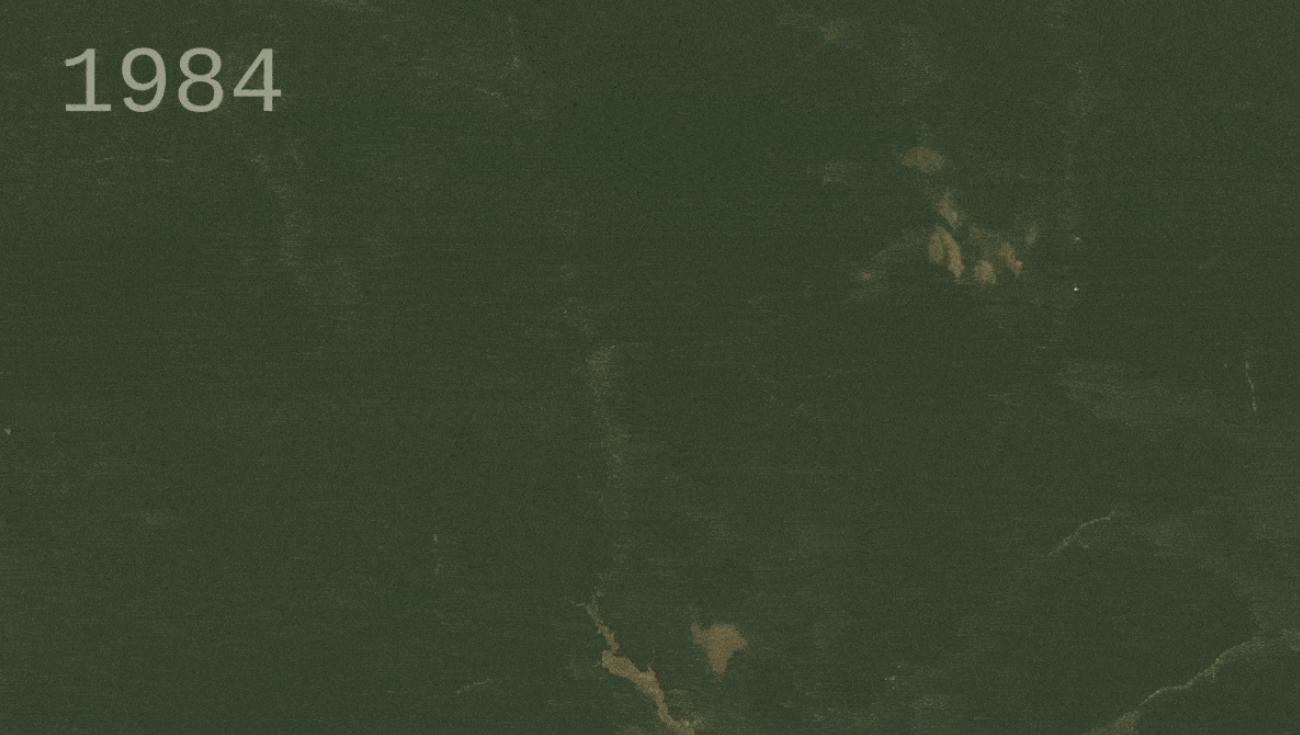


Multi Band Raster

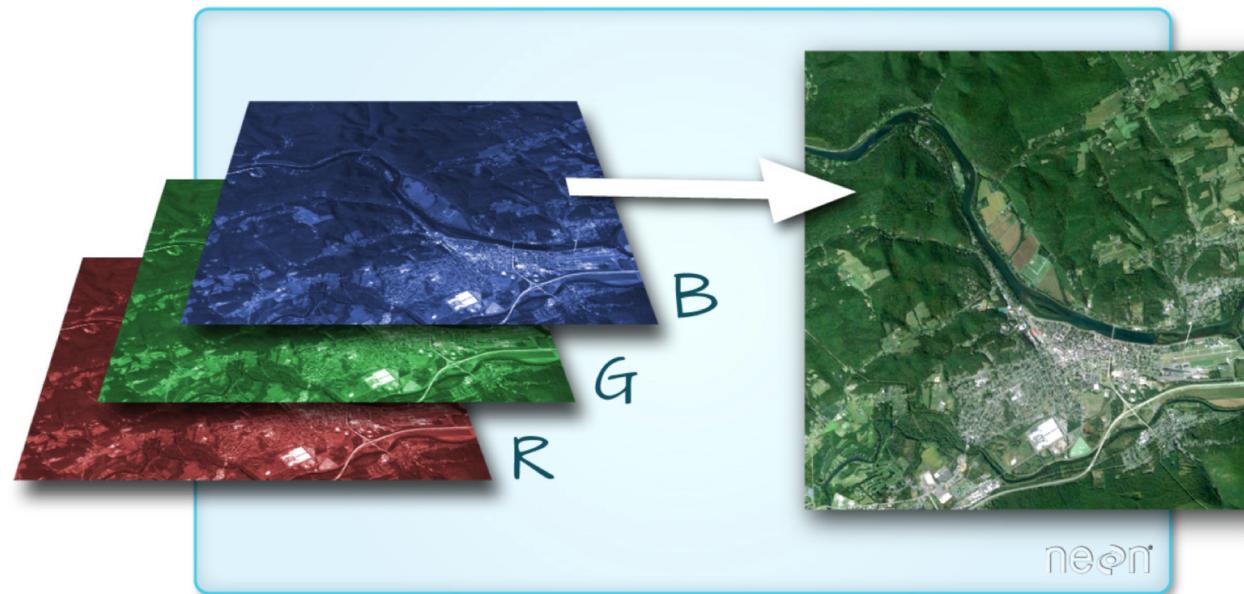


Deforestation, by color

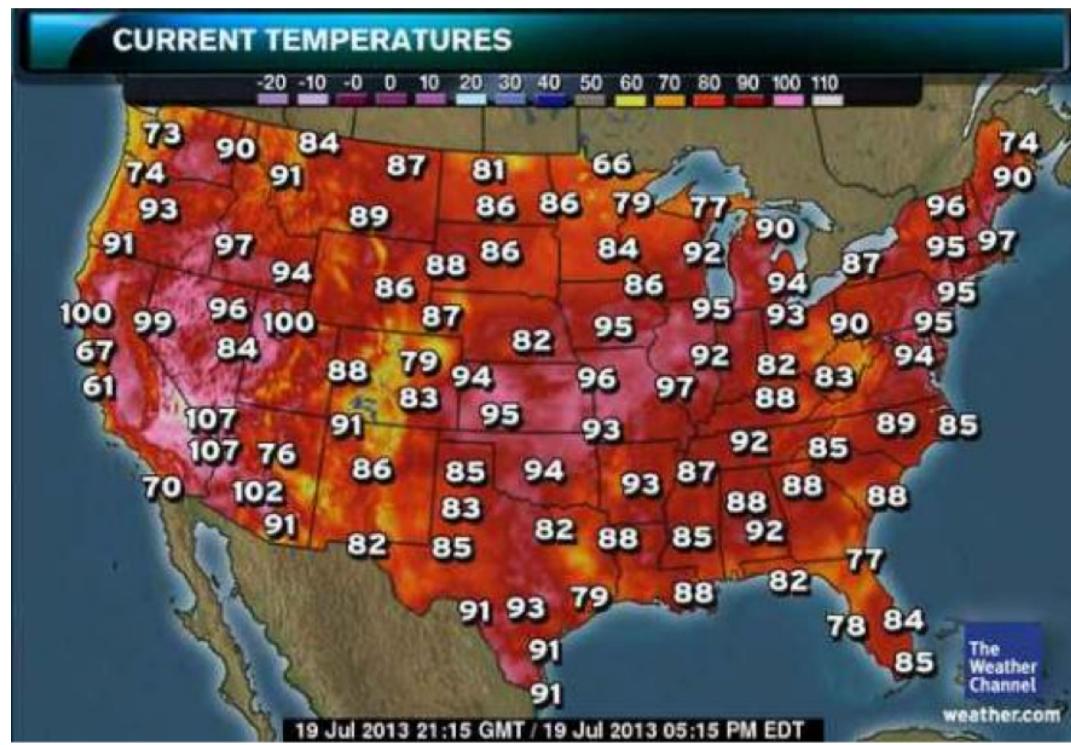
1984

A dark green satellite map of South America, showing deforestation patterns in 1984. The map highlights areas of forest loss, particularly in the Amazon basin and along the southern coastlines of Brazil and Argentina. The deforested areas appear as lighter green or yellowish patches against the darker green background of the remaining forest.

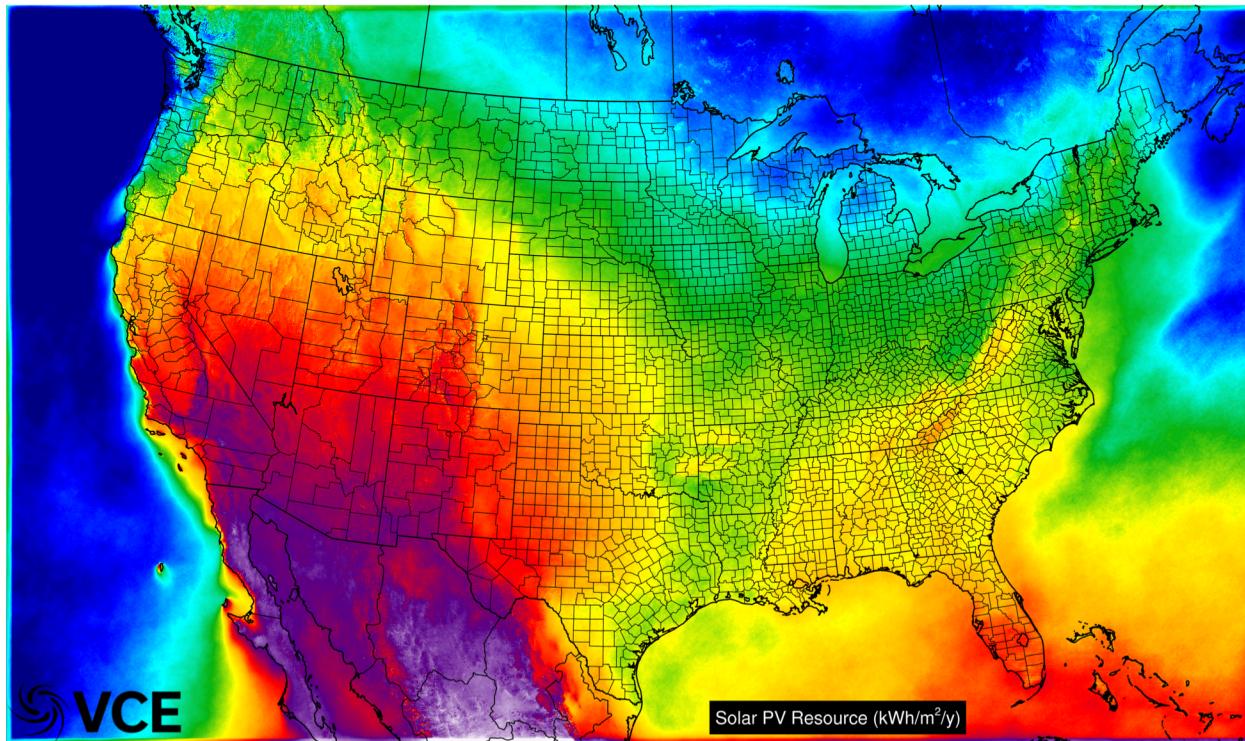
Rasters can use color to hold data



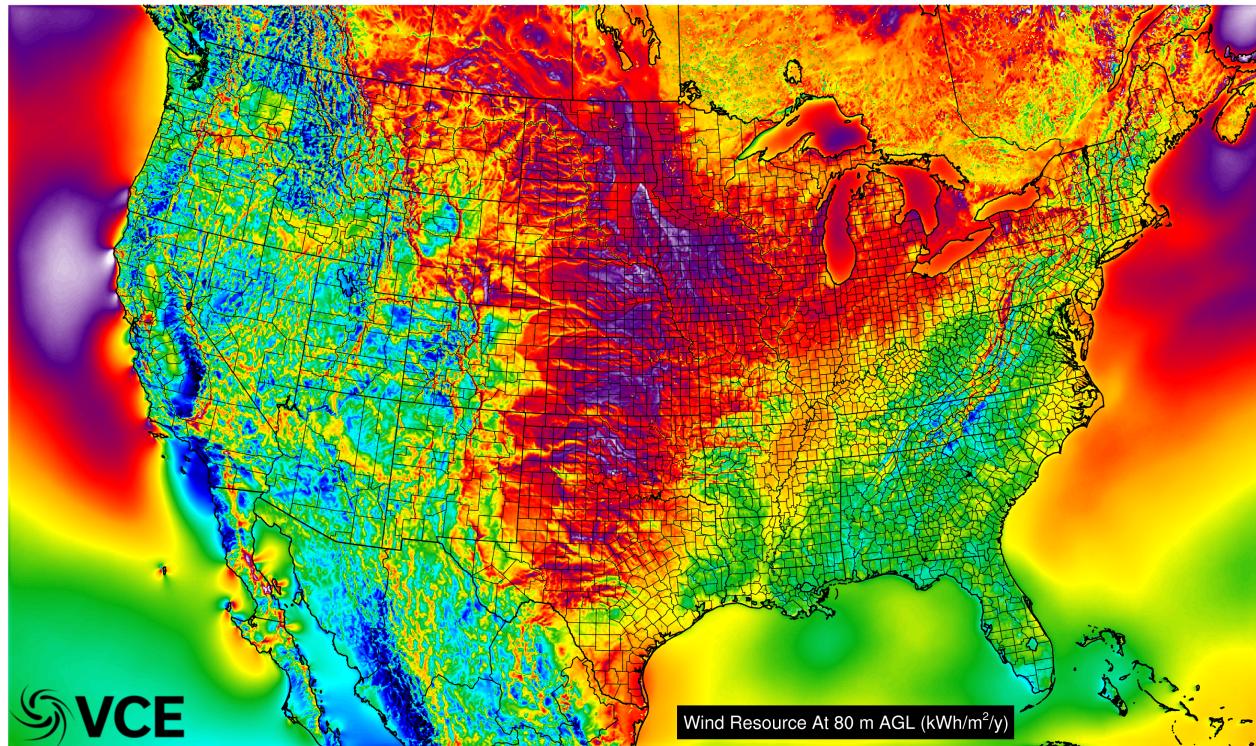
A familiar raster image



Solar PV resource raster



Wind power resource



Data available from NREL

- <https://www.nrel.gov/gis/data.html>

We will start with some elevation data

- USGS

<https://viewer.nationalmap.gov/launch/>