

Methodology

Image Credit: <https://climate.copernicus.eu/node/319>



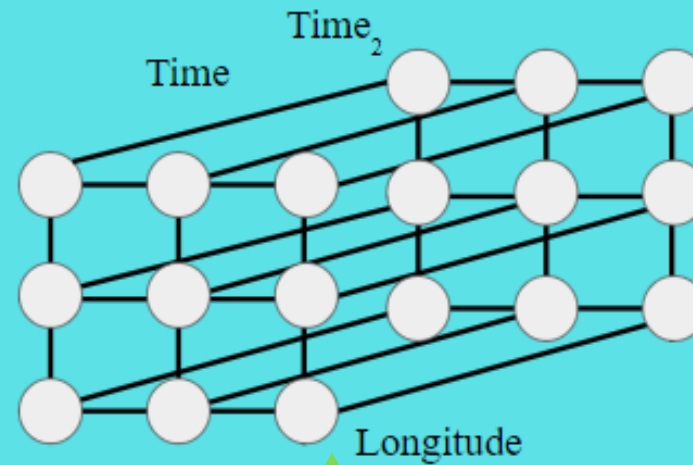
National Centers for Environmental Information

Database: World Ocean 2018 (WOD18)
Dataset: Ocean Station Data (OSD)
(Boyer et al., 2018)

Image Credit: <https://vipulvyas.medium.com/an-in-depth-guide-to-amazon-s3-secure-scalable-and-simple-storage-70a6853313a5>



NetCDF

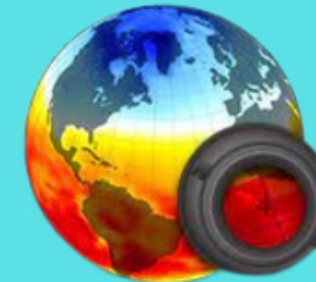


Coordinates: Latitude, Longitude, Depth & Time



Image Credit: <https://colab.research.google.com/>

Image Credit: <https://geoclimatologyblog.wordpress.com/2016/02/21/reading-a-netcdf-file-with-panoply-and-create-some-maps/>



Panoply



.CSV

TWO KEY OBSERVATIONS:

1. Lack of Geospatial Attributes for Parametric Data
2. Lack of Direct Phytoplankton Data

OVERALL APPROACH:

- Total Oceanic Chlorophyll as Proxy for Primary Production & Biomass (Chang et al., 2022)
- Annual Average Value of Parameters from 1954-2017

1. Time Series Models Using Sinusoidal Regression and Intervals

$$\phi \pm A$$

$$f(\kappa) = A \sin((2\pi\gamma)\beta + \varepsilon) + \phi$$

2. Linear Regression Models of Total Oceanic Chlorophyll Given Parameters

$$f(\kappa) = m\beta + \beta_0$$

3. Driving Parameters and Inter-Parameter Relationships Using PCA and Covariance Matrices

$$M(\beta) = \sqrt{(C_{PC1})^2 \cdot v_{PC1} + (C_{PC2})^2 \cdot v_{PC2}}$$