

# Assignment 03

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## 1. Global methane levels from 2002

### 1.1 Methane climatology for each month

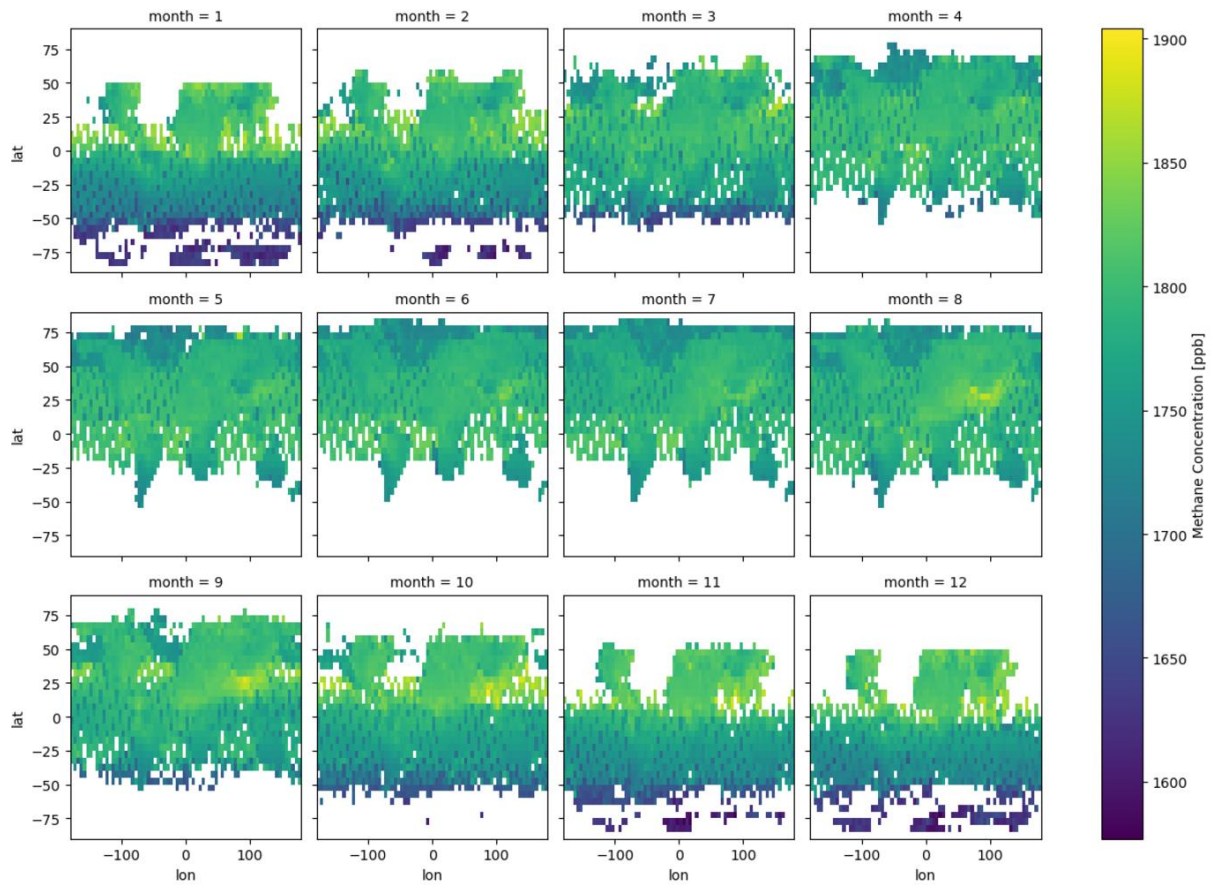


Figure 1 Monthly Methane Climatology

## 1.2 Global methane concentration Time Series

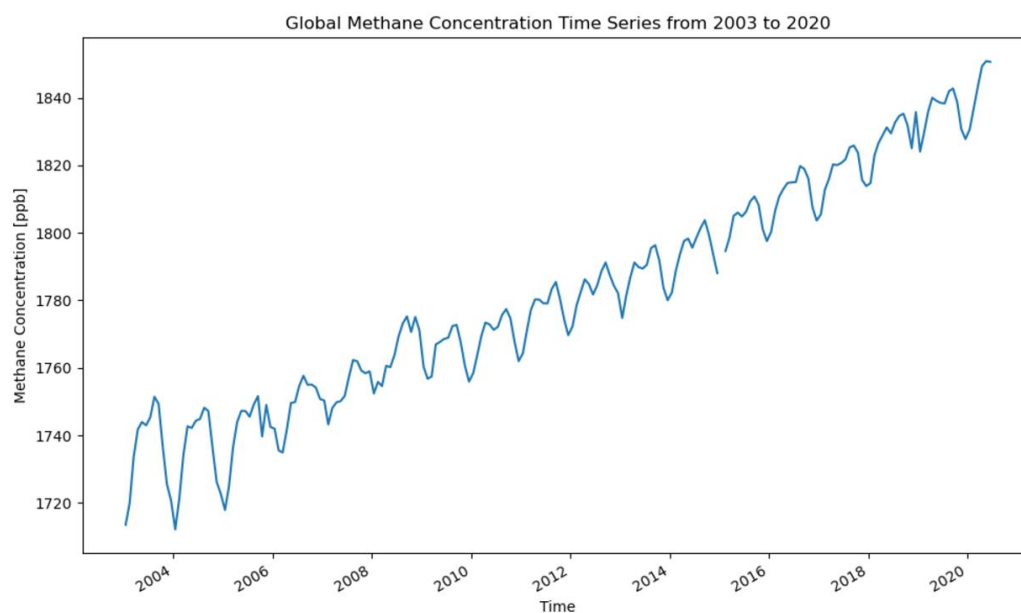


Figure 2 Global Methane Concentration Time Series from 2003 to 2020

从 2003 年到 2020 年，全球甲烷浓度呈现出明显的上升趋势，同时伴随着季节性波动。甲烷浓度在起初的三年内波动较大，2006 年后呈现较稳定的增长趋势。

## 1.3 Deseasonalized methane levels

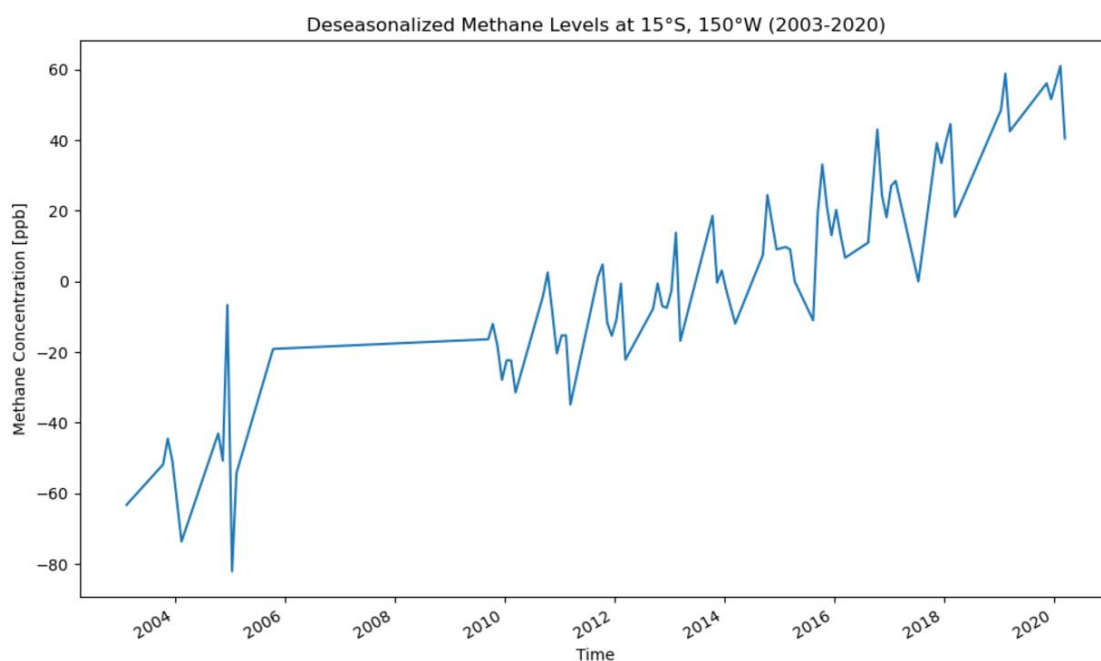


Figure 3 Deseasonalized Methane Levels at 15°S, 150°W (2003-2020)

该地点 2010 年前的数据缺失较多，2010 ~ 2020 年期间的甲烷浓度整体上呈现出明显的上升趋势。

## 2. Niño 3.4 index

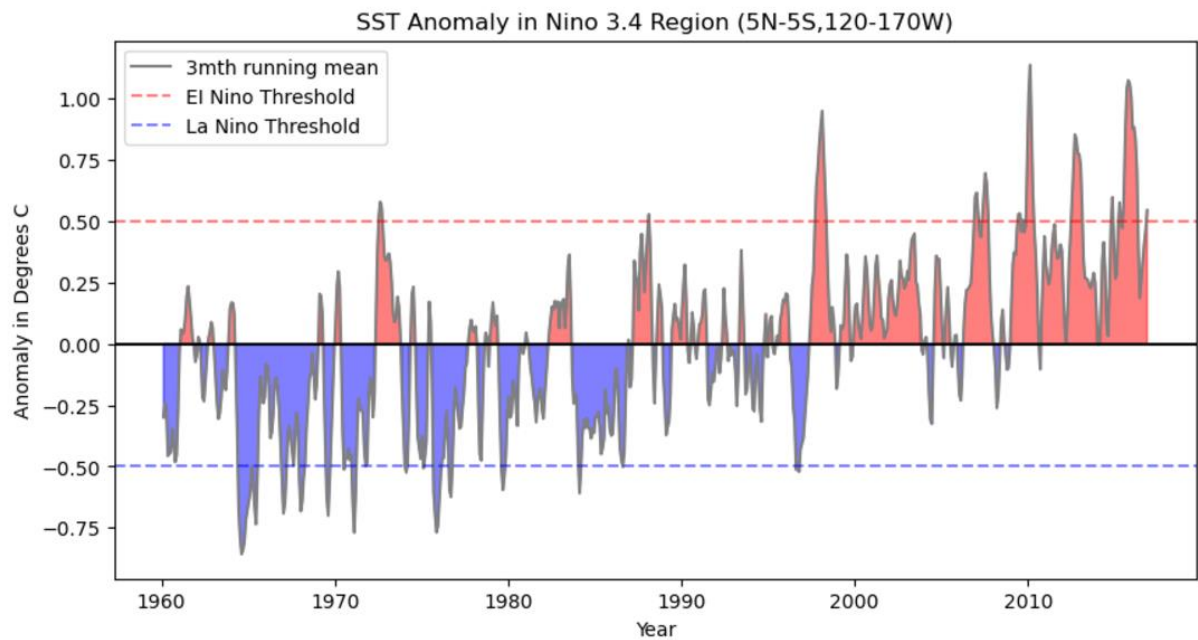


Figure 4 SST Anomaly in Nino 3.4 Region (5N-5S,120-170W)

## 3. Explore a netCDF dataset

### 3.1 Plot a time series

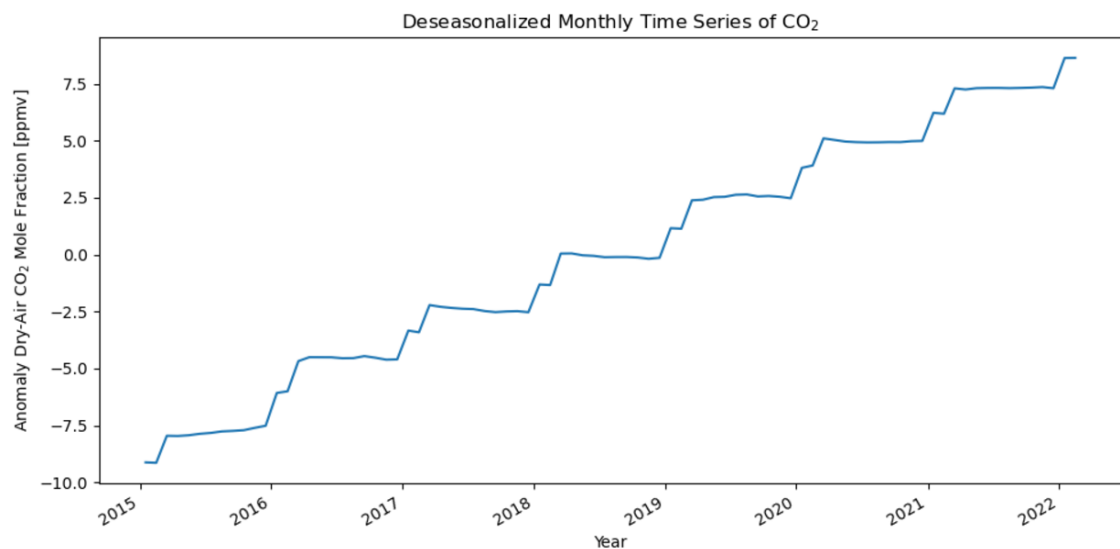


Figure 5 Deseasonalized Monthly Time Series of CO<sub>2</sub>

### 3.2 Plot 5 plot

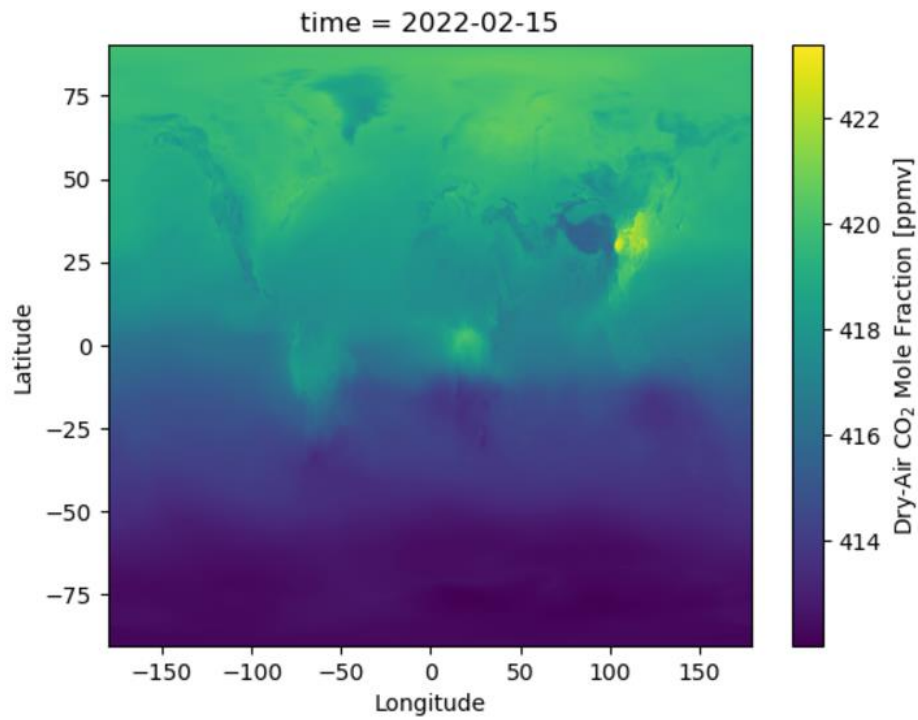


Figure 6 Latest CO<sub>2</sub> Concentrations

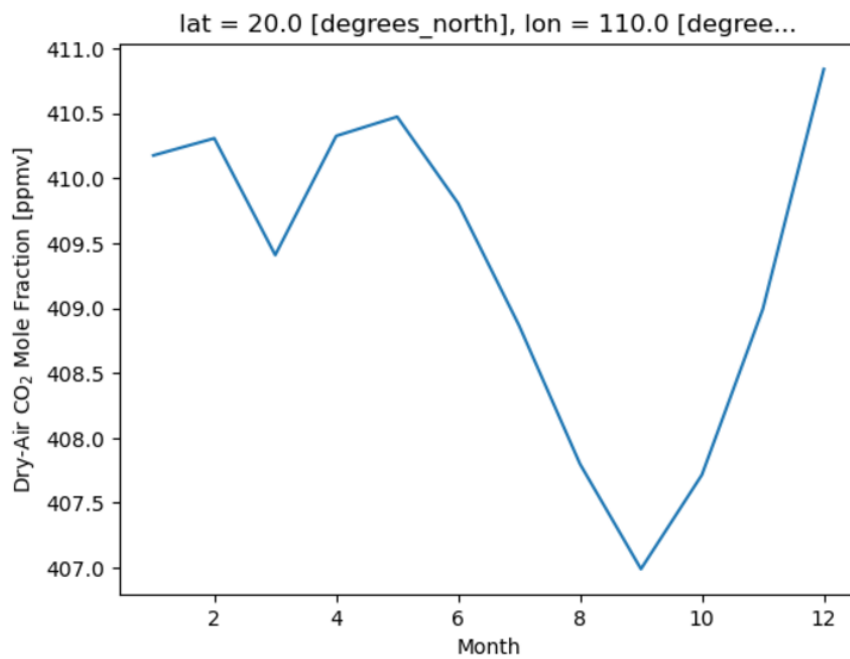


Figure 7 Haikou CO<sub>2</sub> Climatology

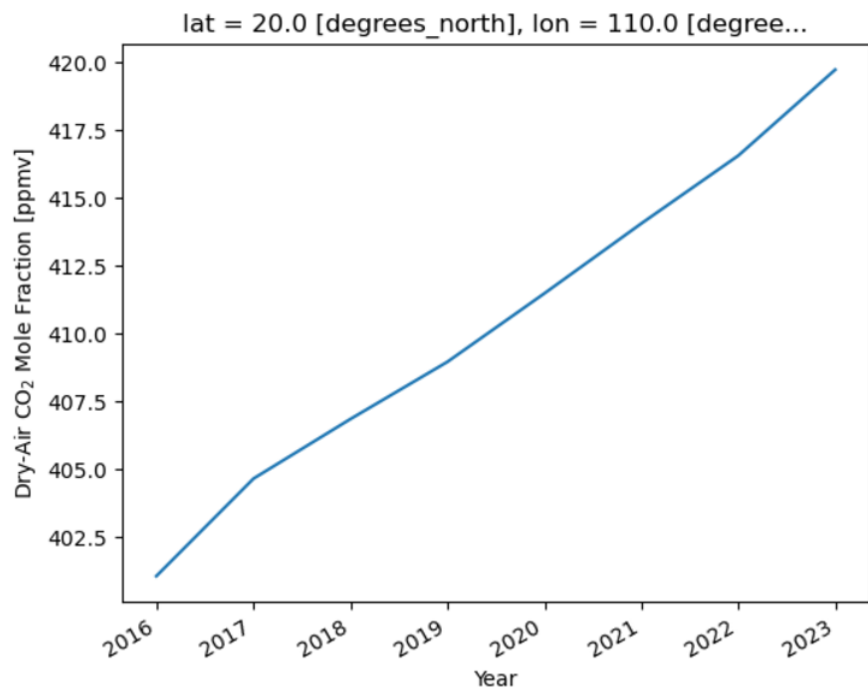


Figure 8 Average CO<sub>2</sub> Concentration Trends in Haikou City (1 year rolling)

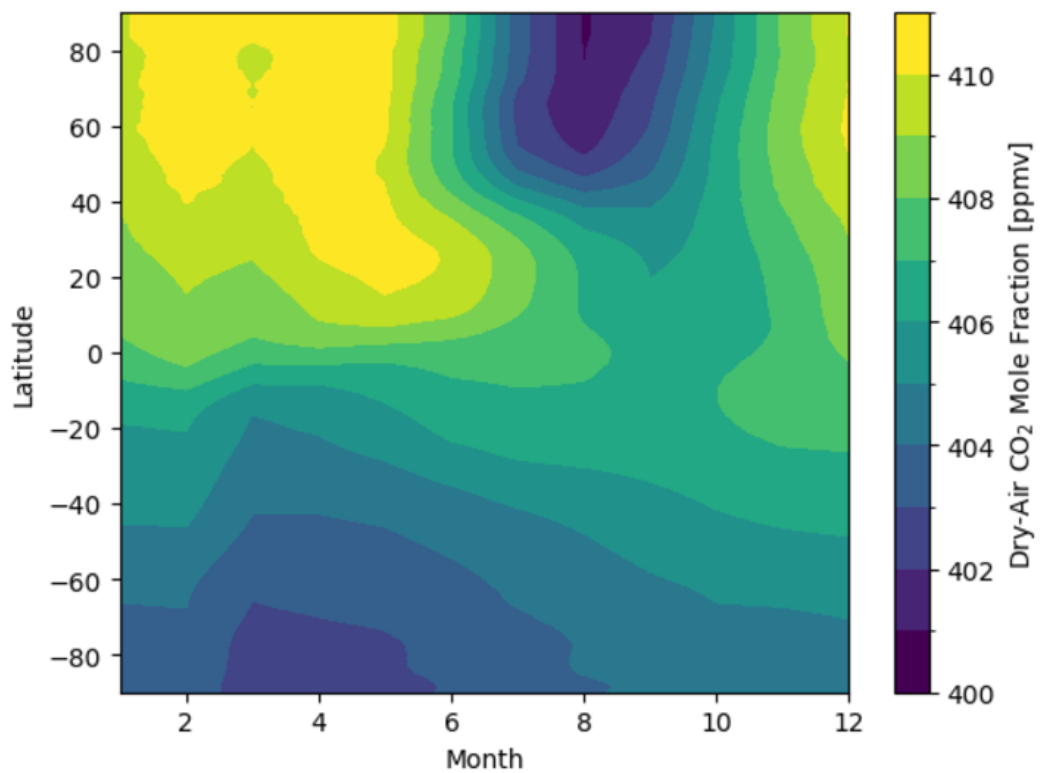


Figure 9 Zonal Mean Climatology

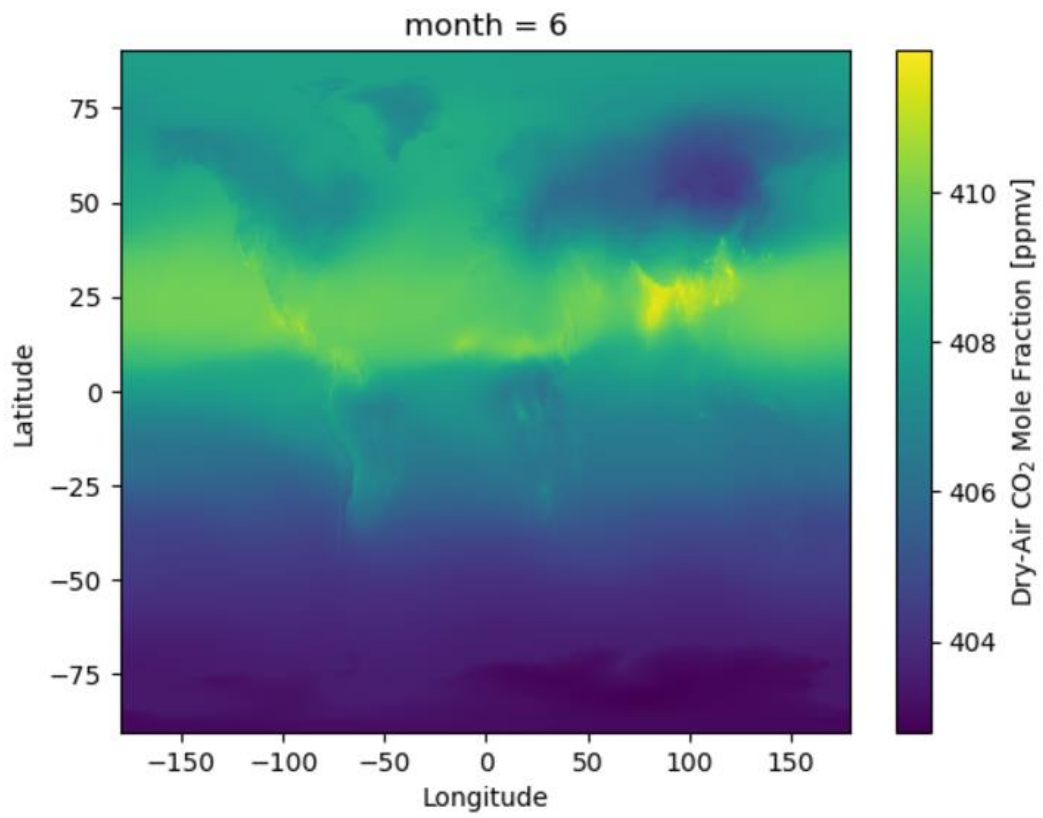


Figure 10 Global CO<sub>2</sub> Concentration Patterns in June