chl_visual

June 22, 2023

[ ]:
```
import pandas as pd
import numpy as np

df_chl = pd.read_csv("chl_means_new.csv")
df_chl.head(5)
```

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	Lat	Long	Ocean	Cr_nmol/kg	Year	chl_01	chl_02	chl_03	\
0	21	-132	Pacific	NaN	1983.0	0.06898	0.062931	0.052969	
1	21	-132	Pacific	3.190219	1983.0	0.06898	0.062931	0.052969	
2	21	-132	Pacific	3.132063	1983.0	0.06898	0.062931	0.052969	
3	21	-132	Pacific	NaN	1983.0	0.06898	0.062931	0.052969	
4	21	-132	Pacific	3.424319	1983.0	0.06898	0.062931	0.052969	

	chl_04	chl_05	chl_06	chl_07	chl_08	chl_09	chl_10	\
0	0.047427	0.049164	0.048803	0.045213	0.042394	0.044499	0.049289	
1	0.047427	0.049164	0.048803	0.045213	0.042394	0.044499	0.049289	
2	0.047427	0.049164	0.048803	0.045213	0.042394	0.044499	0.049289	
3	0.047427	0.049164	0.048803	0.045213	0.042394	0.044499	0.049289	
4	0.047427	0.049164	0.048803	0.045213	0.042394	0.044499	0.049289	

	chl_11	chl_12
0	0.060621	0.066887
1	0.060621	0.066887
2	0.060621	0.066887
3	0.060621	0.066887
4	0.060621	0.066887

[ ]:
```
month_name = ["01","02","03","04","05","06","07","08","09","10","11","12"]
df_chl['yearly_mean_chl'] = df_chl[['chl_' + month for month in month_name]].
 ↪mean(axis=1)
df_chl.head(5)
```

[ ]:

	Lat	Long	Ocean	Cr_nmol/kg	Year	chl_01	chl_02	chl_03	\
0	21	-132	Pacific	NaN	1983.0	0.06898	0.062931	0.052969	
1	21	-132	Pacific	3.190219	1983.0	0.06898	0.062931	0.052969	
2	21	-132	Pacific	3.132063	1983.0	0.06898	0.062931	0.052969	
3	21	-132	Pacific	NaN	1983.0	0.06898	0.062931	0.052969	
4	21	-132	Pacific	3.424319	1983.0	0.06898	0.062931	0.052969	

```
     chl_04    chl_05    chl_06    chl_07    chl_08    chl_09    chl_10  \
0  0.047427  0.049164  0.048803  0.045213  0.042394  0.044499  0.049289
1  0.047427  0.049164  0.048803  0.045213  0.042394  0.044499  0.049289
2  0.047427  0.049164  0.048803  0.045213  0.042394  0.044499  0.049289
3  0.047427  0.049164  0.048803  0.045213  0.042394  0.044499  0.049289
4  0.047427  0.049164  0.048803  0.045213  0.042394  0.044499  0.049289

     chl_11    chl_12  yearly_mean_chl
0  0.060621  0.066887         0.053265
1  0.060621  0.066887         0.053265
2  0.060621  0.066887         0.053265
3  0.060621  0.066887         0.053265
4  0.060621  0.066887         0.053265
```

[ ]:
```
for col in df_chl.columns:
    if 'chl' in col:
        print(f"Correlation between 'Cr_nmol/kg' and '{col}': {df_chl['Cr_nmol/
 ↪kg'].corr(df_chl[col])}")
```

```
Correlation between 'Cr_nmol/kg' and 'chl_01': 0.2222380030471767
Correlation between 'Cr_nmol/kg' and 'chl_02': 0.239509176886822
Correlation between 'Cr_nmol/kg' and 'chl_03': 0.1575600091263584
Correlation between 'Cr_nmol/kg' and 'chl_04': 0.07302255062946351
Correlation between 'Cr_nmol/kg' and 'chl_05': -0.06234617009495116
Correlation between 'Cr_nmol/kg' and 'chl_06': -0.08492823354130775
Correlation between 'Cr_nmol/kg' and 'chl_07': -0.06148940897283865
Correlation between 'Cr_nmol/kg' and 'chl_08': 0.017685228049793285
Correlation between 'Cr_nmol/kg' and 'chl_09': 0.03633780981839884
Correlation between 'Cr_nmol/kg' and 'chl_10': 0.20825374588132703
Correlation between 'Cr_nmol/kg' and 'chl_11': 0.20822047938850002
Correlation between 'Cr_nmol/kg' and 'chl_12': 0.17539221611321804
Correlation between 'Cr_nmol/kg' and 'yearly_mean_chl': 0.11206869836067768
```

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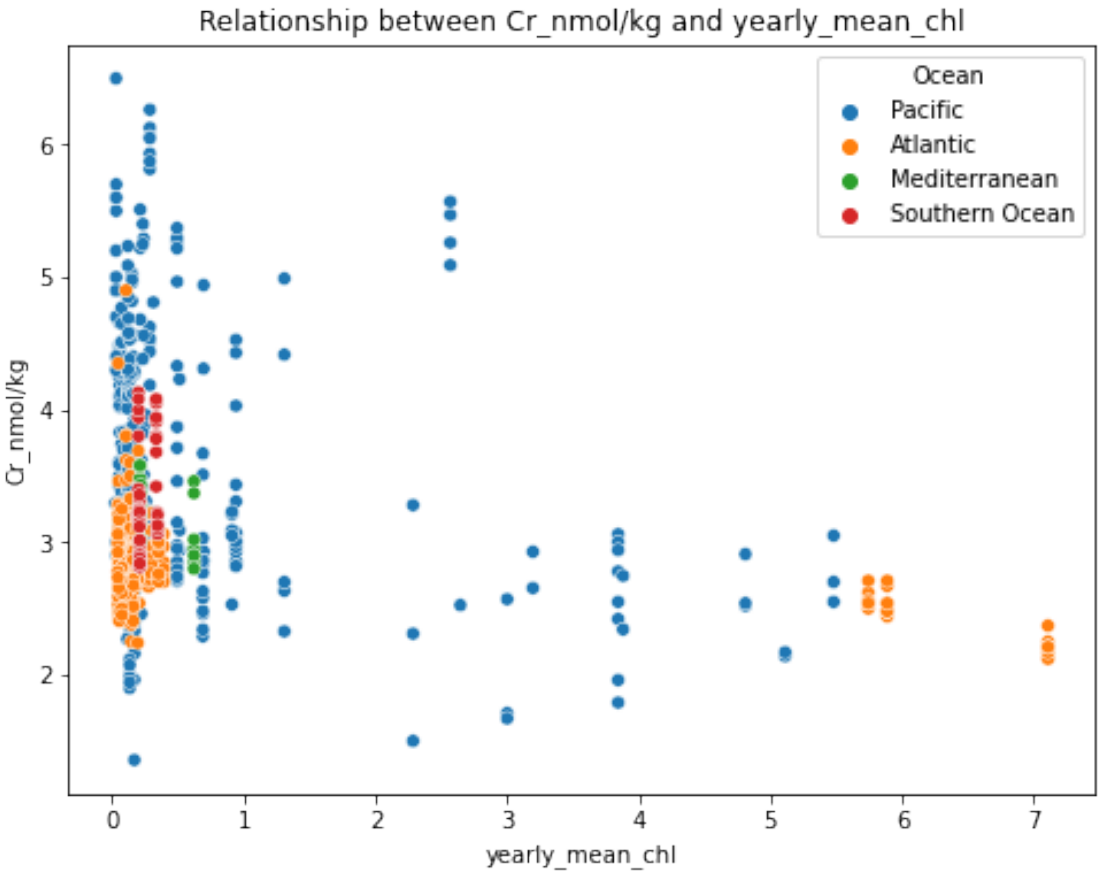
```
#From the code above, we find that the correlation between CHL and Chromium␣
 ↪concentration is very little
```

[ ]:
```
import seaborn as sns
import matplotlib.pyplot as plt

df_chl[df_chl['yearly_mean_chl'] < 0] = np.nan #Remove points with missing data␣
 ↪since missing data are filled with -9999

plt.figure(figsize=(8, 6))
sns.scatterplot(data=df_chl, x='yearly_mean_chl', y='Cr_nmol/kg', hue='Ocean')
plt.title('Relationship between Cr_nmol/kg and yearly_mean_chl')
plt.show()
```


Relationship between Cr_nmol/kg and yearly_mean_chl
Ocean
Pacific
Atlantic
Mediterranean
Southern Ocean
Cr_nmol/kg
yearly_mean_chl
0
1
2
3
4
5
6
7
2
3
4
5
6