04.1

import pandas as pd import matplotlib.pyplot as plt import cartopy.crs as ccrs import cartopy.feature as cfeature df = pd.read_csv('usgs_earthquakes.csv') df_top50 = df.sort_values(by='mag', ascending=False).head(50)

绘图

fig, ax = plt.subplots(figsize=(12, 8), subplot_kw={'projection': ccrs.PlateCarree()}) ax.set_global() ax.add_feature(cfeature.LAND) ax.add_feature(cfeature.OCEAN) ax.add_feature(cfeature.COASTLINE) ax.add_feature(cfeature.BORDERS, linestyle=':')

绘制地震点

sizes = df_top50['mag'] * 10 scatter = ax.scatter(df_top50['longitude'], df_top50['latitude'], c=df_top50['mag'], s=sizes, cmap='Reds', alpha=0.6, edgecolor='none') cbar = plt.colorbar(scatter, ax=ax, orientation='vertical', shrink=0.5) cbar.set_label('Magnitude') plt.title('Top 50 Earthquakes') plt.show()

import netCDF4 as nc import numpy as np import matplotlib.pyplot as plt import cartopy.crs as ccrs import cartopy.feature as cfeature

用的是作业3甲烷的文件

4.2.1

dataset = nc.Dataset('200301_202006-C3S-L3_GHG-PRODUCTS-OBS4MIPS-MERGED-v4.3.nc') lats = dataset.variables['lat'][:] lons = dataset.variables['lon'][:] xch4 = dataset.variables['xch4'][0, :, :] fig = plt.figure(figsize=(14, 7)) ax = fig.add_subplot(1, 1, 1, projection=ccrs.PlateCarree()) ax.set_global() ax.add_feature(cfeature.LAND) ax.add_feature(cfeature.OCEAN) ax.add_feature(cfeature.COASTLINE) ax.add_feature(cfeature.BORDERS, linestyle=':') ax.gridlines(draw_labels=True) cbar = ax.pcolormesh(lons, lats, xch4, transform=ccrs.PlateCarree(), cmap='Reds') plt.colorbar(cbar, ax=ax, orientation='vertical', shrink=0.5, label='CH4 Concentration (ppb)') plt.title('Global Map of Methane (CH4) Levels') plt.xlabel('Longitude') plt.ylabel('Latitude') plt.show()

4.2.2

```
lon_min, lon_max, lat_min, lat_max = 73, 135, 18, 54 #中国的经纬度范围 fig =
plt.figure(figsize=(14, 7)) ax = fig.add_subplot(1, 1, 1,
projection=ccrs.PlateCarree()) ax.set_extent([lon_min, lon_max, lat_min, lat_max],
crs=ccrs.PlateCarree()) ax.add_feature(cfeature.LAND)
ax.add_feature(cfeature.OCEAN) ax.add_feature(cfeature.COASTLINE)
ax.add_feature(cfeature.BORDERS, linestyle=':') ax.gridlines(draw_labels=True)
cbar = ax.pcolormesh(lons, lats, xch4, transform=ccrs.PlateCarree(), cmap='Reds')
plt.colorbar(cbar, ax=ax, orientation='vertical', shrink=0.5, label='CH4
Concentration (ppb)') plt.title('Regional Map of Methane (CH4) Levels')
plt.xlabel('Longitude') plt.ylabel('Latitude') plt.show()
```