

1

```
In [8]: import numpy as np
import pandas as pd
import xarray as xr
from matplotlib import pyplot as plt
%matplotlib inline
import cartopy.crs as ccrs
import cartopy.feature as cfeature
```

```
In [ ]: df=pd.read_csv('usgs_earthquakes.csv')
```

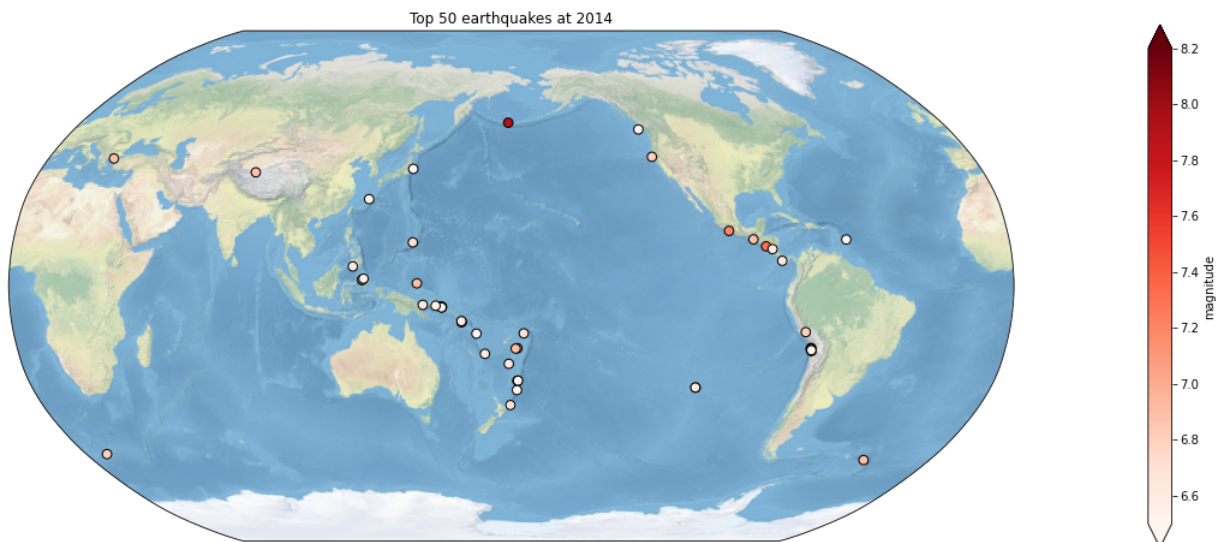
```
In [45]: t_50=df.sort_values(by='mag', ascending=False)[:50]
```

```
In [64]: projection_pre = ccrs.Robinson(central_longitude=180)
fig, ax = plt.subplots(figsize=(20, 20), subplot_kw=dict(projection=projection_pre))
ax.set_global()
ax.stock_img()
# ax.gridlines(color='black', draw_labels=True)

lon=t_50.longitude
lat=t_50.latitude

sc=ax.scatter(lon, lat, s=60, c=t_50.mag, cmap='Reds', edgecolors='k', transform=ccrs.PlateC
plt.colorbar(sc, shrink=.4, pad=.1, extend='both', label='magnitude')
plt.title('Top 50 earthquakes at 2014')
```

```
Out[64]: Text(0.5, 1.0, 'Top 50 earthquakes at 2014')
```



2.1

```
In [ ]: all_eq=df.sort_values(by='mag', ascending=False)
```

```
In [61]: projection_pre = ccrs.Robinson(central_longitude=180)
fig, ax = plt.subplots(figsize=(40, 40), subplot_kw=dict(projection=projection_pre))
```

```

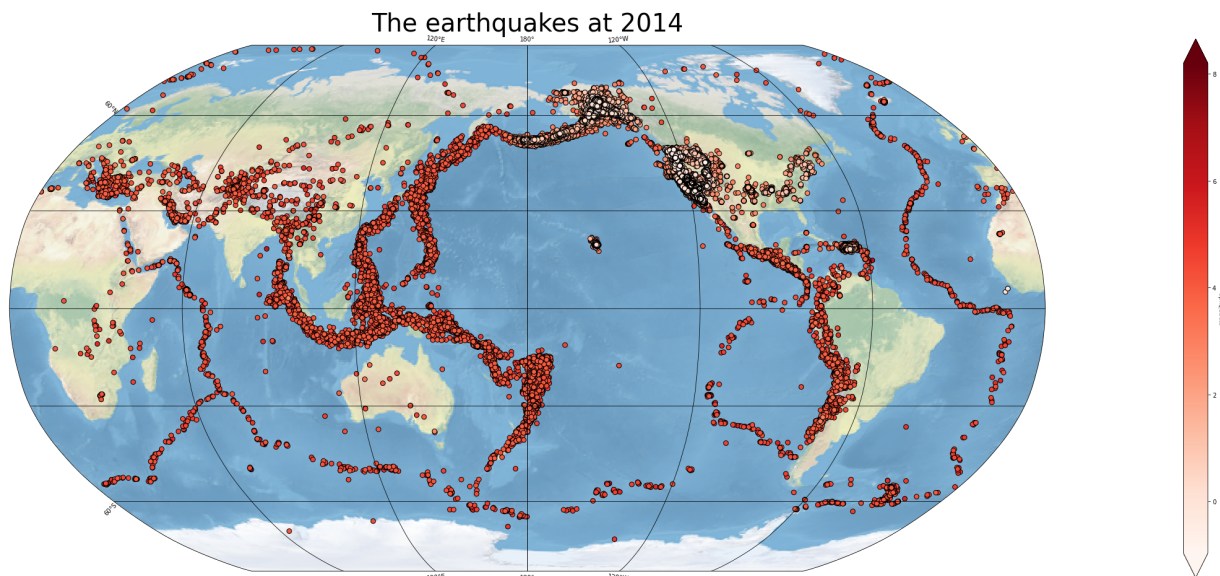
ax.set_global()
ax.stock_img()
ax.gridlines(color='black', draw_labels=True)

lon=all_eq.longitude
lat=all_eq.latitude

sc=ax.scatter(lon, lat, s=60, c=all_eq.mag, cmap='Reds', edgecolors='k', transform=ccrs.Plat
plt.colorbar(sc, shrink=.4, pad=.1, extend='both', label='magnitude')
plt.title('The earthquakes at 2014', fontsize=40)

```

Out[61]: Text(0.5, 1.0, 'The earthquakes at 2014')



2.2

In [10...

```

# Create and define the size of a figure object
plt.figure(figsize=(10,5), dpi=80)

# Set Orthographic projection style
central_lon, central_lat = 114.06, 22.54 # Shenzhen
proj = ccrs.Orthographic(central_lon, central_lat)

# Create an axes with Orthographic projection style
ax = plt.axes(projection=proj)

# Set a region and plot
extent = [central_lon-30, central_lon+20, central_lat-5, central_lat+20]
ax.set_extent(extent)

# Add features to axes using cartopy.feature (cfeature)
ax.add_feature(cfeature.LAKES, edgecolor='blue', facecolor='blue', zorder=2)
ax.add_feature(cfeature.RIVERS, edgecolor='blue', zorder=3)

ax.coastlines(resolution='10m', linewidth=0.5)
ax.stock_img()
ax.gridlines(color='black', draw_labels=True)

lon=all_eq.longitude
lat=all_eq.latitude

```

```
sc=ax.scatter(lon,lat,s=60,c=all_eq.mag,cmap='Accent',edgecolors='k',transform=ccrs.Pl  
plt.colorbar(sc,shrink=.4,pad=.1,extend='both',label='magnitude')  
plt.title('The regional earthquakes at 2014',fontsize=10)
```

Out[109]: Text(0.5, 1.0, 'The regional earthquakes at 2014')

