In [1]:
```
pip install pandas
```

```
Requirement already satisfied: pandas in c:\users\samil\anaconda3\lib\site-packages (2.0.3)Note: you may need to restart the kernel to use updated packages.

Requirement already satisfied: pytz>=2020.1 in c:\users\samil\anaconda3\lib\site-packages (from pandas) (2020.1)
Requirement already satisfied: tzdata>=2022.1 in c:\users\samil\anaconda3\lib\site-packages (from pandas) (2023.3)
Requirement already satisfied: python-dateutil>=2.8.2 in c:\users\samil\anaconda3\lib\site-packages (from pandas) (2.8.2)
Requirement already satisfied: numpy>=1.20.3; python_version < "3.10" in c:\users\samil\anaconda3\lib\site-packages (from pandas) (1.24.4)
Requirement already satisfied: six>=1.5 in c:\users\samil\anaconda3\lib\site-packages (from python-dateutil>=2.8.2->pandas) (1.15.0)
```

In [2]:
```
pip install plotly
```

```
Requirement already satisfied: plotly in c:\users\samil\anaconda3\lib\site-packages (5.18.0)
Requirement already satisfied: tenacity>=6.2.0 in c:\users\samil\anaconda3\lib\site-packages (from plotly) (8.2.3)
Requirement already satisfied: packaging in c:\users\samil\anaconda3\lib\site-packages (from plotly) (20.4)
Requirement already satisfied: pyparsing>=2.0.2 in c:\users\samil\anaconda3\lib\site-packages (from packaging->plotly) (2.4.7)
Requirement already satisfied: six in c:\users\samil\anaconda3\lib\site-packages (from packaging->plotly) (1.15.0)
Note: you may need to restart the kernel to use updated packages.
```

In [3]:
```
import matplotlib.pyplot as plt
from mpl_toolkits.mplot3d import Axes3D
from matplotlib.animation import FuncAnimation
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
```

```
C:\Users\Samil\anaconda3\lib\site-packages\pandas\core\computation\expressions.py:20: UserWarning: Pandas requires version '2.7.3' or newer of 'numexpr' (version '2.7.1' current
ly installed).
  from pandas.core.computation.check import NUMEXPR_INSTALLED
```

In [14]:
```
raw_dataset=pd.read_csv("MarmaraAll.csv",sep=",")
```

In [15]:
```
 MarmaraAll= raw_dataset.copy()
MarmaraAll.head()
```

Out[15]:

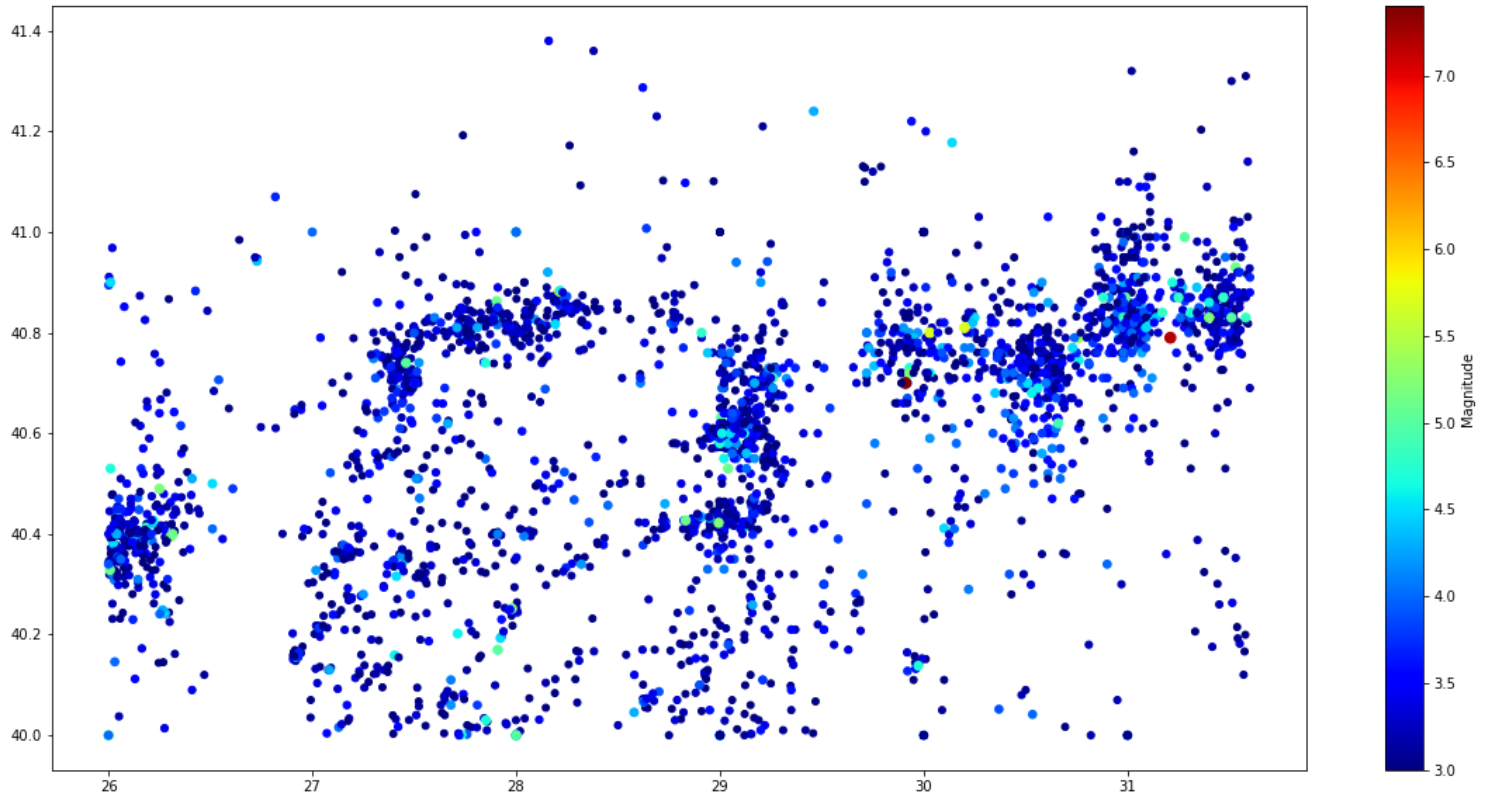
	Date	Longitude	Latitude	Depth	Magnitude
0	10/01/2024 17:10:06	28.8706	40.4117	11.20	3.6
1	09/01/2024 01:56:28	28.8386	40.4133	10.63	3.1
2	30/12/2023 20:43:24	29.1583	40.2431	9.07	3.4
3	24/12/2023 15:18:56	28.8339	40.4225	10.44	3.0
4	21/12/2023 14:03:08	27.4839	40.7247	10.40	3.1

In [33]:
```
MarmaraAll.shape
```

Out[33]:
```
(2836, 5)
```

In [34]:
```
x = MarmaraAll.iloc[:,1].values
y = MarmaraAll.iloc[:,2].values
z = MarmaraAll.iloc[:,3].values
colors = MarmaraAll.iloc[:,4].values
sizes = MarmaraAll.iloc[:,4].values*8
```

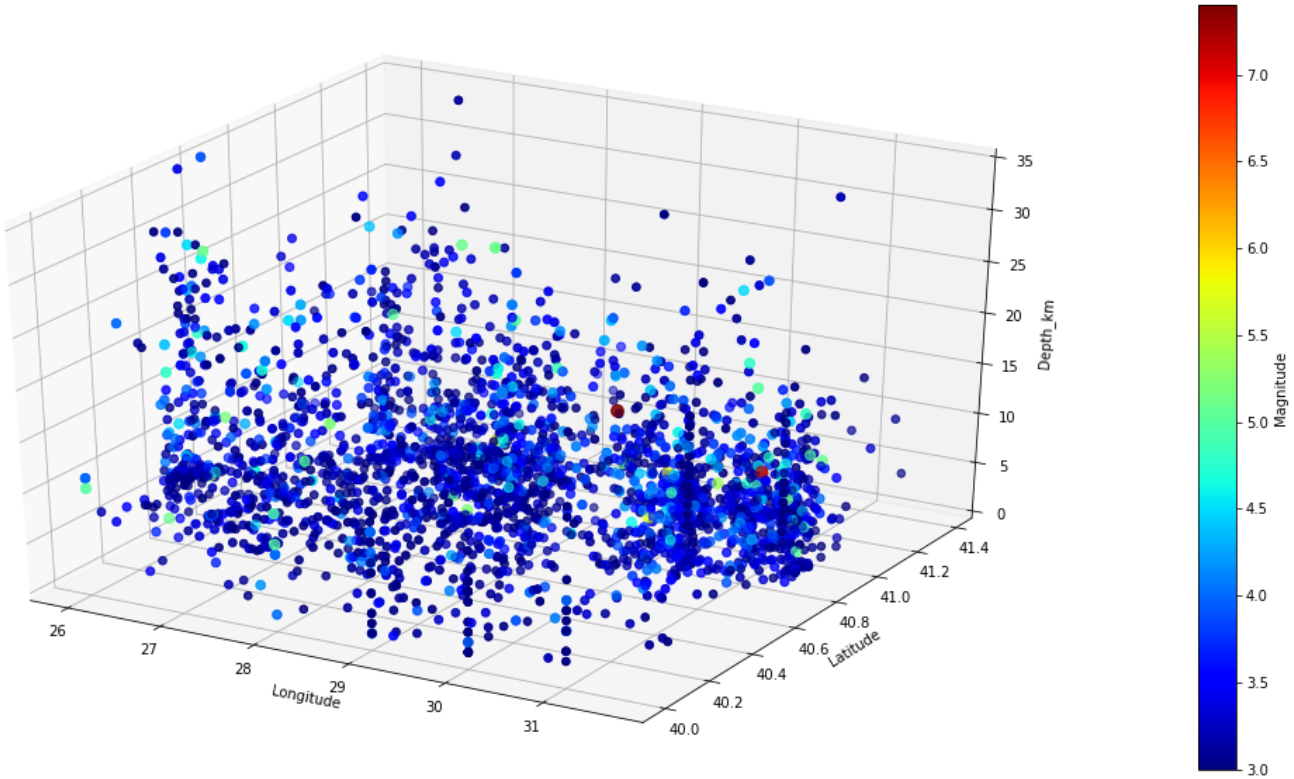
In [35]:
```
fig = plt.figure(figsize=(20, 10))
my_cmap = plt.get_cmap('jet')

plt.scatter(x, y, c=colors, s=sizes, cmap= 'jet')
ax.scatter(x, y, z, c=colors, s=sizes, cmap='jet')
cbar = plt.colorbar(ax.scatter(x, y, z, c=colors, s=sizes, cmap='jet'))
ax.set_xlabel('Longitude')
ax.set_ylabel('Latitude')
cbar.set_label('Magnitude')
ax.set_zlabel('Depth_km')
font_size = 700
dpi = (5000)
font_size = 1000
plt.show()
```



In [19]:
```
import plotly.graph_objects as go
# Yüksek çözünürlüklü dünya haritası verilerini çevrimiçi olarak alın
fig = go.Figure(go.Choroplethmapbox(
 geojson="https://raw.githubusercontent.com/johan/world.geo.json/master/countries.geo.json",
 locations=["USA", "CAN", "MEX", "RUS", "CHN"], # Örnek ülke kodları (ABD, Kanada, Meksika, Rusya, Çin)
 z=[1, 1, 1, 1, 1], # Ülkelere atanacak değerler (hepsi 1 olarak ayarlanmıştır)
 colorscale='Jet', # Renk skalası adı (Viridis, YlGnBu, Jet vb.)
 zmin=3,
 zmax=8,
 marker_opacity=0.9, # Ülke sınırlarının opaklığı
 marker_line_width=1, # Ülke sınırlarının kenarlık kalınlığı
))
# Örnek deprem verilerini oluşturun
deprem_verileri = {
 'Longitude': x,
 'Latitude': y,
 'Magnitude': colors,
 }
# Scatter plot ile deprem verilerini ekleyin
fig.add_trace(go.Scattermapbox(
 lat=deprem_verileri['Latitude'],
 lon=deprem_verileri['Longitude'],
 mode='markers',
 marker=dict(
 size=deprem_verileri['Magnitude'] * 2, # Magnitude değerine göre nokta boyutlarını belirleme
 color=deprem_verileri['Magnitude'], # Magnitude değerine göre renk skalasını belirleme
 colorscale='Jet', # Renk skalası adı (Viridis, YlGnBu, Jet vb.)
 ),
 ))
# Harita düzenini ve stilini belirleyin
fig.update_layout(
 mapbox_style="carto-positron", # Harita stilini belirleme (diğer stiller için: "open-street-map", "stamen-terrain" vb.)
 mapbox_zoom=6, # Harita yakınlaştırma düzeyini belirleme
 mapbox_center={"lat": 30.000, "lon": 30.0000}, # Harita merkezini belirleme (ABD'nin merkezi)
)
dpi = (9000)
font_size = 1000
# Grafiği görüntüleyin
fig.show()
```

In [20]:
```
x = MarmaraAll.iloc[:,1].values
y = MarmaraAll.iloc[:,2].values
z = MarmaraAll.iloc[:,3].values
colors = MarmaraAll.iloc[:,4].values
sizes = MarmaraAll.iloc[:,4].values*10
```

In [21]:
```
fig = plt.figure(figsize=(20, 10))

ax = fig.add_subplot(111, projection='3d')

ax.scatter(x, y, z, c=colors, s=sizes, cmap='jet')


cbar = plt.colorbar(ax.scatter(x, y, z, c=colors, s=sizes, cmap='jet'))

cbar.set_label('Magnitude')


ax.set_xlabel('Longitude')
ax.set_ylabel('Latitude')
ax.set_zlabel('Depth_km')




dpi = (5000)
font_size = 1000

ax.set_zlim(0, 35)


plt.show()
```



In [22]:
```
x = MarmaraAll.iloc[:,1].values
y = MarmaraAll.iloc[:,2].values
z = MarmaraAll.iloc[:,3].values
colors = MarmaraAll.iloc[:,4].values
sizes = MarmaraAll.iloc[:,4].values*2
```

In [23]:
```
import plotly.graph_objs as go
import numpy as np

# Veri oluşturma (x, y, z, colors, sizes tanımlanmış olarak varsayıldı)

trace = go.Scatter3d(
    x=x,
    y=y,
    z=z,
    mode='markers',
    marker=dict(
        size=sizes,
        color=colors,
        colorscale='Jet',
        opacity=0.5,
        colorbar=dict(title='Magnitude')
    )
)

layout = go.Layout(
    scene=dict(
        xaxis=dict(title='Longitude'),
        yaxis=dict(title='Latitude'),
        zaxis=dict(title='Depth_km'),
        aspectmode='manual',
        aspectratio=dict(x=1, y=2, z=1),
        camera=dict(eye=dict(x=2, y=1, z=1))
    ),
    coloraxis=dict(colorbar=dict(len=0.75))
)

fig = go.Figure(data=[trace], layout=layout)

# Grafik döndürme
frames = []
for angle in np.linspace(0, 360, 36):
    frame = go.Frame(layout=dict(scene=dict(camera=dict(eye=dict(x=2*np.cos(np.radians(angle)), y=2*np.sin(np.radians(angle)), z=2)))))
    frames.append(frame)

fig.frames = frames
fig.update_layout(updatemenus=[dict(type='buttons', showactive=False, buttons=[dict(label='Play', method='animate', args=[None, dict(frame=dict(duration=200, redraw=True), fromcu

fig.show()
```

In [24]:
```
x = MarmaraAll.iloc[:,1].values
y = MarmaraAll.iloc[:,2].values
z = MarmaraAll.iloc[:,0].values
colors = MarmaraAll.iloc[:,4].values+1
sizes = MarmaraAll.iloc[:,4].values*10
```

In [25]:
```
z
```

Out[25]:
```
array(['10/01/2024 17:10:06', '09/01/2024 01:56:28',
       '30/12/2023 20:43:24', ..., '27/01/1990 14:30:47',
       '04/01/1990 11:32:14', '03/01/1990 13:30:14'], dtype=object)
```

In [26]:
```
from datetime import datetime
old_dates = z
old_format = '%d/%m/%Y %H:%M:%S'
new_format = '%Y-%m-%d %H:%M:%S'
new_dates = []
for date_str in old_dates:
 new_date = datetime.strptime(date_str, old_format).strftime(new_format)
 new_dates.append(new_date)
print(new_dates)
```

```
['2024-01-10 17:10:06', '2024-01-09 01:56:28', '2023-12-30 20:43:24', '2023-12-24 15:18:56', '2023-12-21 14:03:08', '2023-12-17 20:53:52', '2023-12-14 09:50:16', '2023-12-13
20:04:38', '2023-12-08 23:21:05', '2023-12-06 10:01:44', '2023-12-04 14:46:13', '2023-12-04 09:25:03', '2023-12-04 08:18:53', '2023-12-04 07:57:18', '2023-12-04 07:45:33', '2
023-12-04 07:42:20', '2023-11-07 20:05:48', '2023-10-26 17:18:24', '2023-10-15 16:57:33', '2023-10-13 19:54:07', '2023-10-11 16:36:01', '2023-09-13 07:45:09', '2023-08-19 14:
43:46', '2023-08-06 15:29:01', '2023-07-27 08:32:50', '2023-06-16 22:19:59', '2023-06-05 10:11:30', '2023-06-04 03:23:47', '2023-06-03 11:07:51', '2023-06-02 00:52:42', '2023
-05-26 05:59:57', '2023-05-26 05:59:31', '2023-05-09 07:20:49', '2023-05-04 01:50:00', '2023-04-30 11:01:53', '2023-04-30 04:02:54', '2023-04-20 10:41:35', '2023-04-09 00:40:
32', '2023-03-17 11:01:53', '2023-03-17 11:00:37', '2023-03-16 17:18:15', '2023-03-16 16:36:01', '2023-03-16 13:04:46', '2023-03-16 11:04:59', '2023-03-16 10:55:06', '2023-03
-09 05:28:53', '2023-03-07 08:36:30', '2023-03-05 05:28:07', '2023-02-24 02:08:23', '2023-02-06 04:24:32', '2023-02-05 12:49:58', '2023-02-05 00:15:10', '2023-02-02 20:25:4
3', '2023-02-02 20:08:41', '2023-01-30 10:14:04', '2023-01-17 19:38:47', '2023-01-10 06:15:12', '2023-01-07 07:55:49', '2023-01-02 09:26:32', '2022-12-30 10:29:03', '2022-12-
13 03:21:16', '2022-12-12 12:53:43', '2022-12-04 13:38:01', '2022-12-03 23:33:06', '2022-12-03 04:59:20', '2022-12-02 21:09:00', '2022-12-02 18:49:36', '2022-12-02 10:03:18',
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3:02:29', '2022-10-13 14:25:51', '2022-10-03 22:57:50', '2022-09-29 00:29:25', '2022-09-14 00:38:37', '2022-08-11 19:23:01', '2022-07-28 16:10:48', '2022-07-22 15:55:30', '20
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7:06', '2022-03-22 14:10:55', '2022-03-22 04:22:09', '2022-02-20 20:20:11', '2022-02-06 12:07:53', '2022-01-22 11:13:45', '2022-01-19 02:41:48', '2022-01-17 12:06:49', '2021-
12-29 14:46:17', '2021-11-17 18:35:42', '2021-11-17 12:57:18', '2021-11-17 12:40:15', '2021-09-23 05:57:59', '2021-09-17 09:22:20', '2021-09-07 14:15:58', '2021-07-16 12:29:2
3', '2021-07-12 21:27:35', '2021-06-19 12:07:52', '2021-06-01 07:32:37', '2021-05-05 06:42:11', '2021-04-18 04:33:22', '2021-03-21 21:33:56', '2021-02-27 12:12:06', '2021-02-
11 07:36:25', '2020-12-06 11:30:00', '2020-12-03 02:38:13', '2020-11-20 09:52:54', '2020-11-20 04:20:41', '2020-11-05 05:46:45', '2020-11-04 11:49:35', '2020-10-15 13:55:13',
'2020-09-24 18:06:40', '2020-09-24 13:38:31', '2020-09-08 21:57:23', '2020-07-22 21:14:25', '2020-07-14 20:59:37', '2020-07-04 03:13:22', '2020-06-04 12:14:49', '2020-04-01 1
9:03:24', '2020-03-08 04:21:04', '2020-02-22 01:25:56', '2020-02-02 00:57:43', '2020-01-28 09:47:32', '2020-01-11 13:37:36', '2020-01-11 05:15:26', '2020-01-02 19:35:47', '20
19-12-24 19:35:03', '2019-12-06 22:36:16', '2019-11-22 14:36:42', '2019-11-17 23:23:31', '2019-10-29 15:38:41', '2019-10-27 10:18:46', '2019-10-19 07:34:04', '2019-10-10 19:3
```

In [27]:
```
from datetime import datetime
date_times = new_dates
single_numbers = []
for date_time_str in date_times:
 date_time_obj = datetime.strptime(date_time_str, '%Y-%m-%d %H:%M:%S')
 single_number = int(date_time_obj.strftime('%Y%m%d%H%M%S'))
 single_numbers.append(single_number)
print(single_numbers)
```

```
[20240110171006, 20240109015628, 20231230204324, 20231224151856, 20231221140308, 20231217205352, 20231214095016, 20231213200438, 20231208232105, 20231206100144, 2023120414461
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20190924080022, 20190924073049, 20190823065821, 20190820233607, 20190719134928, 20190711201855, 20190709102753, 20190621034122, 20190614151143, 20190612224450, 2019060213084
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934, 20190220042419, 20190220012740, 20190220003046, 20190220002757, 20190219213355, 20190219212942, 20190219194842, 20190215161427, 20190206193658, 20190111160956, 201901050
```
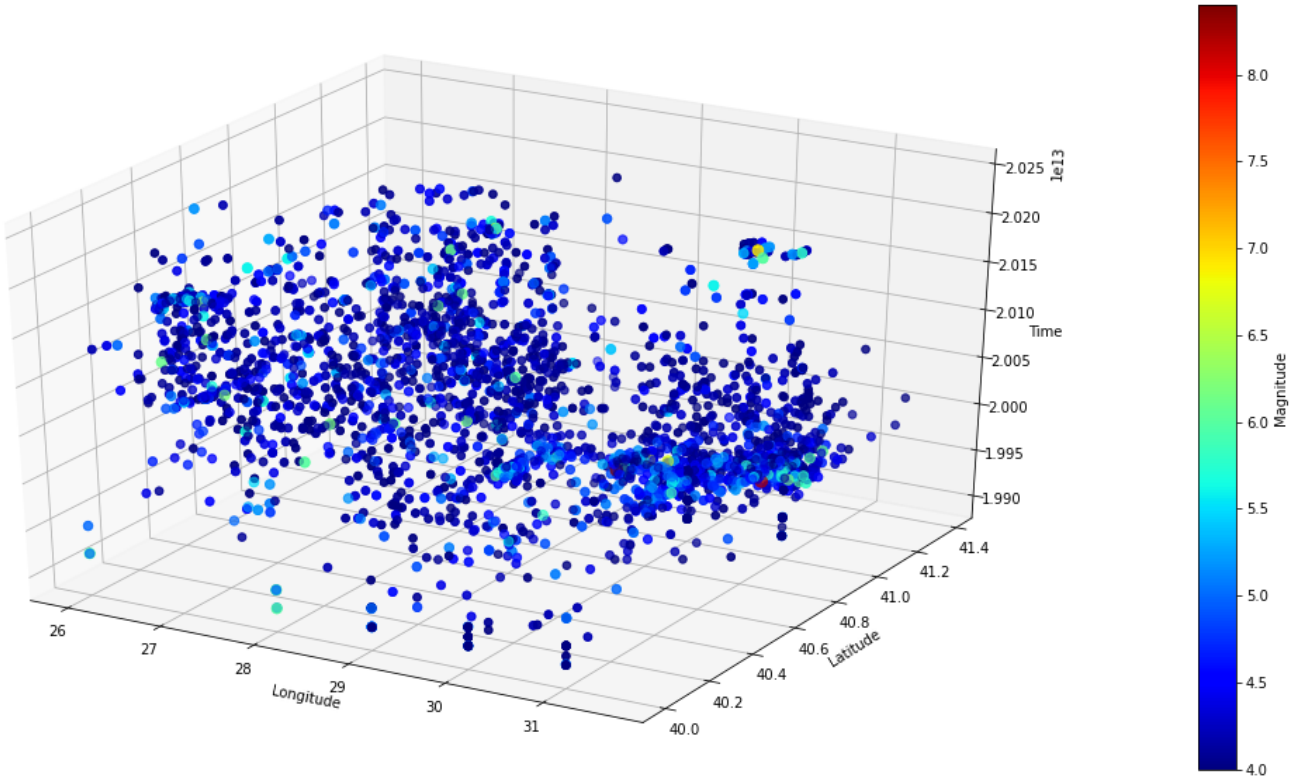

In [28]:
```
timestamps=single_numbers
```

In [29]:
```
timestamps
```

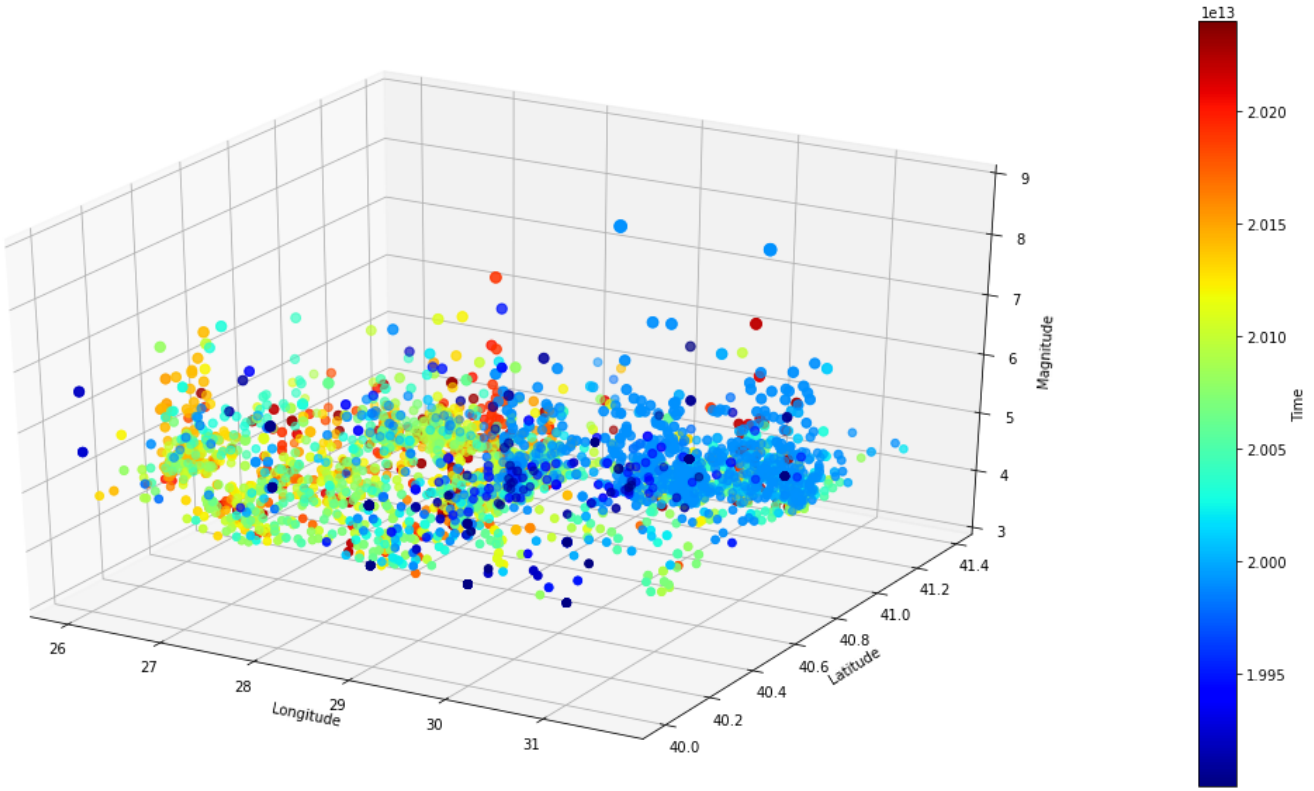
Out[29]:
```
[20240110171006,
 20240109015628,
 20231230204324,
 20231224151856,
 20231221140308,
 20231217205352,
 20231214095016,
 20231213200438,
 20231208232105,
 20231206100144,
 20231204144613,
 20231204092503,
 20231204081853,
 20231204075718,
 20231204074533,
 20231204074220,
 20231107200548,
 20231026171824,
 20231015165733,
```

In [30]:
```
x = MarmaraAll.iloc[:,1].values
y = MarmaraAll.iloc[:,2].values
z =  timestamps
colors =  MarmaraAll.iloc[:,4].values+1
sizes = MarmaraAll.iloc[:,4].values*10

fig = plt.figure(figsize=(20, 10))

ax = fig.add_subplot(111, projection='3d')

ax.scatter(x, y, z, c=colors, s=sizes, cmap='jet')


cbar = plt.colorbar(ax.scatter(x, y, z, c=colors, s=sizes, cmap='jet'))

cbar.set_label('Magnitude')


ax.set_xlabel('Longitude')
ax.set_ylabel('Latitude')
ax.set_zlabel('Time')

font_size = 700

dpi = (5000)
font_size = 1000




plt.show()
```



In [31]:
```
x = MarmaraAll.iloc[:,1].values
y = MarmaraAll.iloc[:,2].values
z =  MarmaraAll.iloc[:,4].values+1.6
colors =  timestamps
sizes = MarmaraAll.iloc[:,4].values*10
```

In [32]:
```
fig = plt.figure(figsize=(20, 10))

ax = fig.add_subplot(111, projection='3d')

ax.scatter(x, y, z, c=colors, s=sizes, cmap='jet')


cbar = plt.colorbar(ax.scatter(x, y, z, c=colors, s=sizes, cmap='jet'))

cbar.set_label('Time')


ax.set_xlabel('Longitude')
ax.set_ylabel('Latitude')
ax.set_zlabel('Magnitude')

font_size = 700

dpi = (5000)
font_size = 1000

ax.set_zlim(3,9)


plt.show()
```


Longitude
Latitude
Magnitude
26
27
28
29
30
31
40.0
40.2
40.4
40.6
40.8
41.0
41.2
41.4
3
4
5
6
7
8
9

1e13
2.020
2.015
2.010
2.005
2.000
1.995
Time

In [ ]:

In [ ]:

In [ ]:

In [ ]:

In [ ]: