

```
In [1]: import pandas as pd
import geopandas as gpd
from shapely.geometry import polygon
```

```
In [2]: import plotly.graph_objs as go
from plotly.offline import init_notebook_mode, iplot, plot
init_notebook_mode(connected=True)
```

```
In [67]: df = gpd.read_file('C:/Users/nikhi/Desktop/Python/Homwork 4/Counties_Georgia.shp')
```

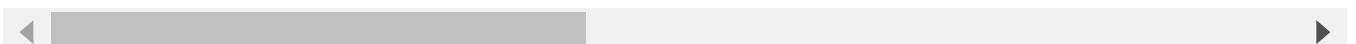
```
In [68]: df.to_csv('geopandas_data_frame_geogia_shp.csv', sep = '\t')
```

```
In [69]: df
```

Out[69]:

	OBJECTID	STATEFP10	COUNTYFP10	GEOID10	NAME10	NAMELSAD10	totpop10	WFD	I
<b>0</b>	1	13	173	13173	Lanier	Lanier County	10078	N	
<b>1</b>	2	13	029	13029	Bryan	Bryan County	30233	N	
<b>2</b>	3	13	001	13001	Appling	Appling County	18236	N	
<b>3</b>	4	13	241	13241	Rabun	Rabun County	16276	N	
<b>4</b>	5	13	023	13023	Bleckley	Bleckley County	13063	N	
...	...	...	...	...	...	...	...	...	
<b>154</b>	101	13	139	13139	Hall	Hall County	179684	N	
<b>155</b>	106	13	255	13255	Spalding	Spalding County	64073	N	
<b>156</b>	149	13	297	13297	Walton	Walton County	83768	N	
<b>157</b>	150	13	231	13231	Pike	Pike County	17869	N	
<b>158</b>	152	13	013	13013	Barrow	Barrow County	69367	N	

159 rows × 21 columns



```
In [70]: df.columns
```

```
Out[70]: Index(['OBJECTID', 'STATEFP10', 'COUNTYFP10', 'GEOID10', 'NAME10',  
              'NAMELSAD10', 'totpop10', 'WFD', 'RDC_AAA', 'MNGWPD', 'MPO', 'MSA',  
              'F1HR_NA', 'F8HR_NA', 'Reg_Comm', 'Acres', 'Sq_Miles', 'Label',  
              'GlobalID', 'last_edite', 'geometry'],  
              dtype='object')
```

```
In [71]: df.head()
```

```
Out[71]:
```

	OBJECTID	STATEFP10	COUNTYFP10	GEOID10	NAME10	NAMELSAD10	totpop10	WFD	RD
0	1	13	173	13173	Lanier	Lanier County	10078	N	
1	2	13	029	13029	Bryan	Bryan County	30233	N	
2	3	13	001	13001	Appling	Appling County	18236	N	
3	4	13	241	13241	Rabun	Rabun County	16276	N	
4	5	13	023	13023	Bleckley	Bleckley County	13063	N	

5 rows × 21 columns



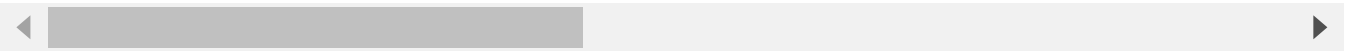
```
In [72]: df.tail()
```

Out[72]:

	OBJECTID	STATEFP10	COUNTYFP10	GEOID10	NAME10	NAMELSAD10	totpop10	WFD	I
--	----------	-----------	------------	---------	--------	------------	----------	-----	---

154	101	13	139	13139	Hall	Hall County	179684	N	
155	106	13	255	13255	Spalding	Spalding County	64073	N	
156	149	13	297	13297	Walton	Walton County	83768	N	
157	150	13	231	13231	Pike	Pike County	17869	N	
158	152	13	013	13013	Barrow	Barrow County	69367	N	

5 rows × 21 columns



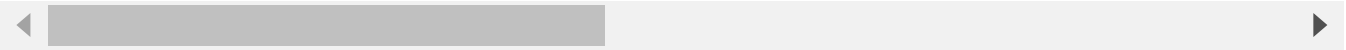
In [73]: `df.head(3)`

Out[73]:

	OBJECTID	STATEFP10	COUNTYFP10	GEOID10	NAME10	NAMELSAD10	totpop10	WFD	RD
--	----------	-----------	------------	---------	--------	------------	----------	-----	----

0	1	13	173	13173	Lanier	Lanier County	10078	N	
1	2	13	029	13029	Bryan	Bryan County	30233	N	
2	3	13	001	13001	Appling	Appling County	18236	N	

3 rows × 21 columns

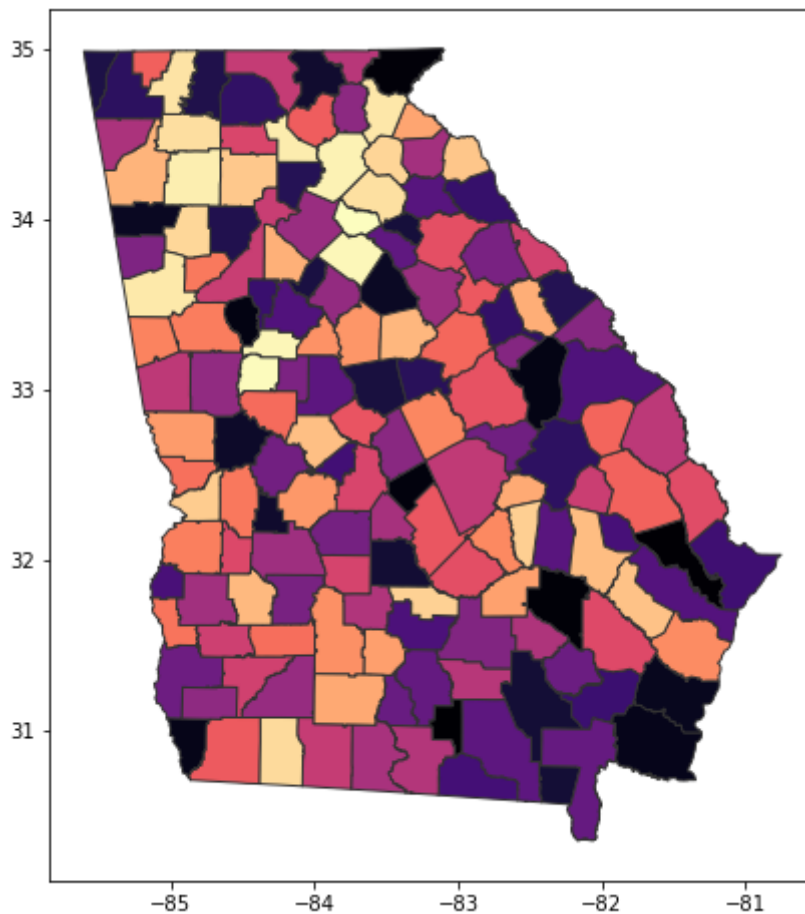


In [74]: `df.plot`

Out[74]: <geopandas.plotting.GeoplotAccessor object at 0x000002678C0A3190>

```
In [75]: df.plot(cmap='magma', edgecolor="0.2", figsize=(25, 8))
```

Out[75]: <AxesSubplot:>



```
In [94]: dxf = pd.read_csv('C:/Users/nikhi/Desktop/Python/Homwork 4/vehicle_fatality.csv')
```

```
In [113... dxf.columns
```

Out[113]: Index(['NAMELSAD10', 'Fatality\_alcoh', 'Fatality\_rate\_alcoh', 'Fatality\_bike', 'Fatality\_rate\_bike', 'Fatality', 'Fatality\_rate', 'Fatality\_ped', 'Fatality\_rate\_ped', 'Fatality\_speed', 'Fatality\_rate\_speed'], dtype='object')

```
In [114... dxf.tail()
```

Out[114]:

	NAMELSAD10	Fatality_alcoh	Fatality_rate_alcoh	Fatality_bike	Fatality_rate_bike	Fatality	Fa
154	Whitfield County	2	1.92	0	0.0	13	
155	Wilcox County	0	0.00	0	0.0	0	
156	Wilkes County	0	0.00	0	0.0	1	
157	Wilkinson County	1	11.07	0	0.0	1	
158	Worth County	1	4.93	0	0.0	5	

```
In [116... dxf.head()
```

```
Out[116]:
```

	NAMELSAD10	Fatality_alcoh	Fatality_rate_alcoh	Fatality_bike	Fatality_rate_bike	Fatality	Fatal
0	Appling County	3	16.21	0	0.00	5	
1	Atkinson County	1	12.05	0	0.00	3	
2	Bacon County	1	8.94	0	0.00	3	
3	Baker County	0	0.00	0	0.00	0	
4	Baldwin County	3	6.69	1	2.23	11	

```
In [118... dxf.shape
```

```
Out[118]: (159, 11)
```

```
In [95]: df_dxf_merge = df.merge(dxf,on = 'NAMELSAD10').drop_duplicates(subset = ['NAMELSAD10'])
```

```
In [100... df_dxf_merge.to_csv('combined_data_frame.csv',sep = '\t')
```

```
In [ ]: df_dxf_merge.to_csv('combined_data_frame.csv', index = False )# to get of index in
```

```
In [101... df_dxf_merge.head()
```

```
Out[101]:
```

	OBJECTID	STATEFP10	COUNTYFP10	GEOID10	NAME10	NAMELSAD10	totpop10	WFD	RD
0	1	13	173	13173	Lanier	Lanier County	10078	N	
1	2	13	029	13029	Bryan	Bryan County	30233	N	
2	3	13	001	13001	Appling	Appling County	18236	N	
3	4	13	241	13241	Rabun	Rabun County	16276	N	
4	5	13	023	13023	Bleckley	Bleckley County	13063	N	

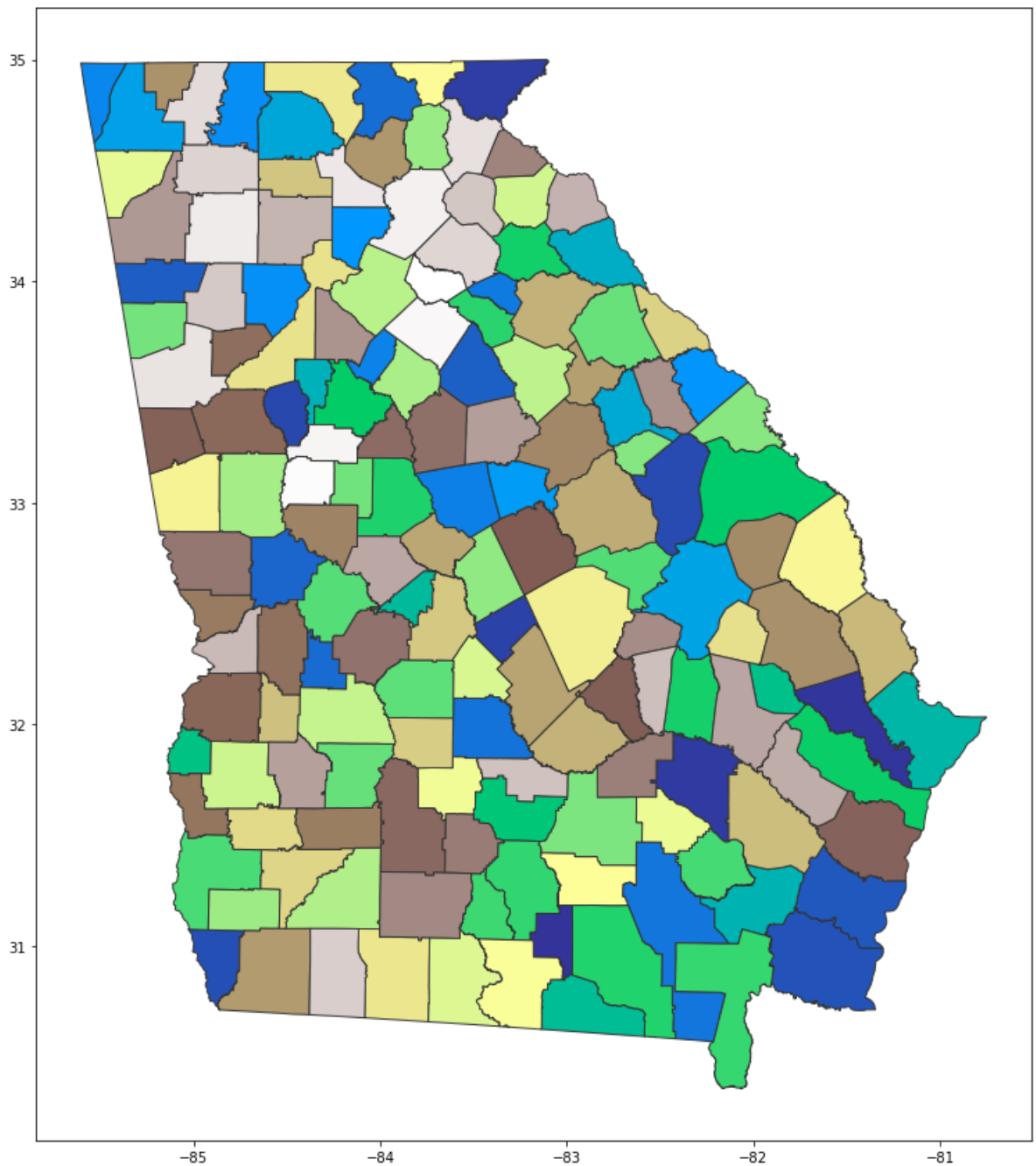
5 rows × 31 columns

```
In [102... # geometry
```

```
In [103... #a)
```

```
In [119... df.plot( cmap="terrain", edgecolor="0.2", figsize=(15, 15))
```

```
Out[119]: <AxesSubplot:>
```



In [105]: `df_dxf_merge.head()`

Out[105]:

	OBJECTID	STATEFP10	COUNTYFP10	GEOID10	NAME10	NAMESAD10	totpop10	WFD	RD
0	1	13	173	13173	Lanier	Lanier County	10078	N	
1	2	13	029	13029	Bryan	Bryan County	30233	N	
2	3	13	001	13001	Appling	Appling County	18236	N	
3	4	13	241	13241	Rabun	Rabun County	16276	N	
4	5	13	023	13023	Bleckley	Bleckley County	13063	N	

5 rows × 31 columns

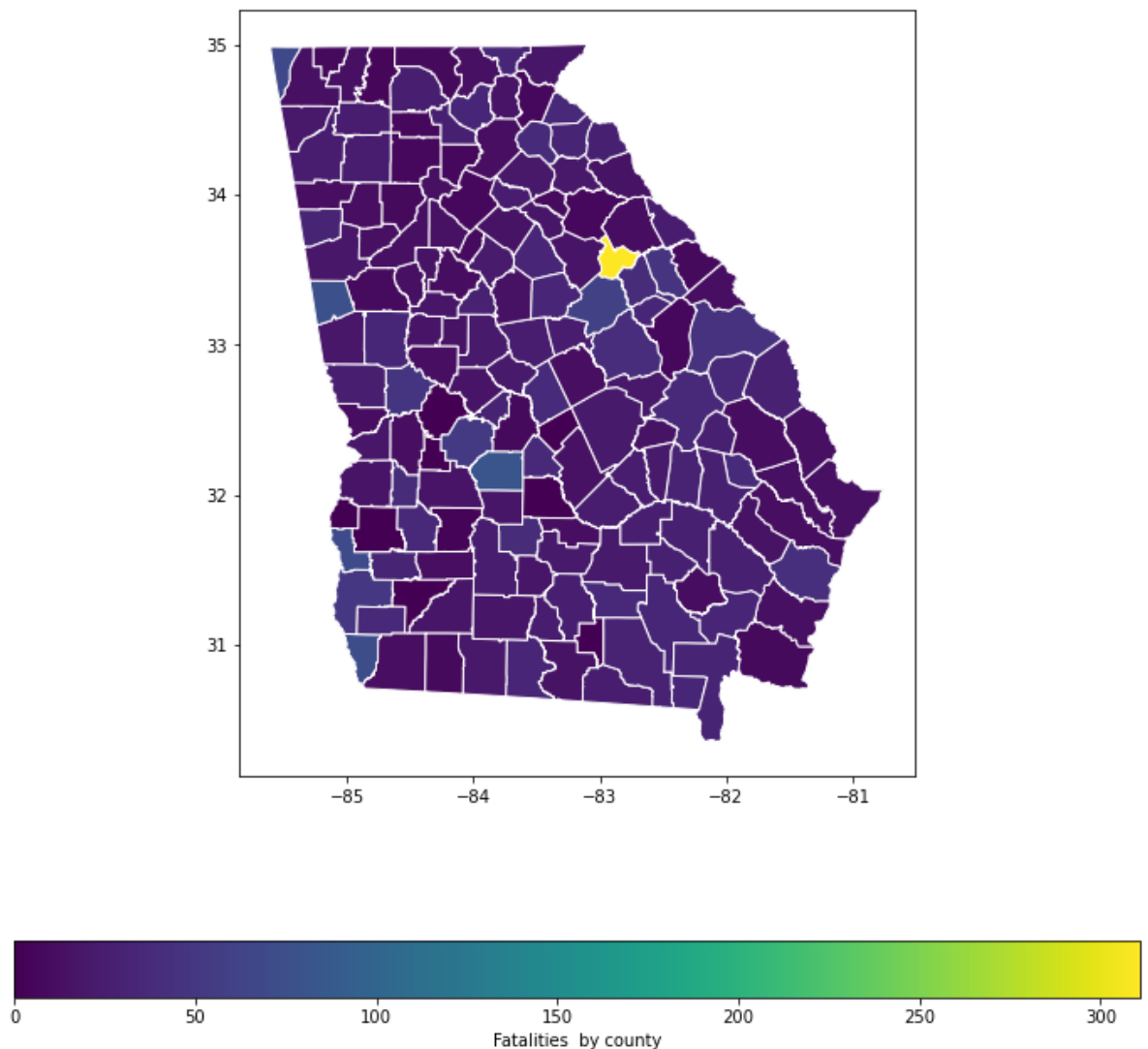
In [106]: `df_dxf_merge.columns`

```
Out[106]: Index(['OBJECTID', 'STATEFP10', 'COUNTYFP10', 'GEOID10', 'NAME10',  
                'NAMELSAD10', 'totpop10', 'WFD', 'RDC_AAA', 'MNGWPD', 'MPO', 'MSA',  
                'F1HR_NA', 'F8HR_NA', 'Reg_Comm', 'Acres', 'Sq_Miles', 'Label',  
                'GlobalID', 'last_edite', 'geometry', 'Fatality_alcoh',  
                'Fatality_rate_alcoh', 'Fatality_bike', 'Fatality_rate_bike',  
                'Fatality', 'Fatality_rate', 'Fatality_ped', 'Fatality_rate_ped',  
                'Fatality_speed', 'Fatality_rate_speed'],  
                dtype='object')
```

```
In [ ]: a)
```

```
In [107...] df_dxf_merge.plot('Fatality_rate', cmap = 'viridis',  
                             edgecolor = 'white', legend = True,  
                             figsize = (12,12),  
                             legend_kwds = {'label': 'Fatalities by county',  
                                             'orientation': 'horizontal'})
```

```
Out[107]: <AxesSubplot:>
```

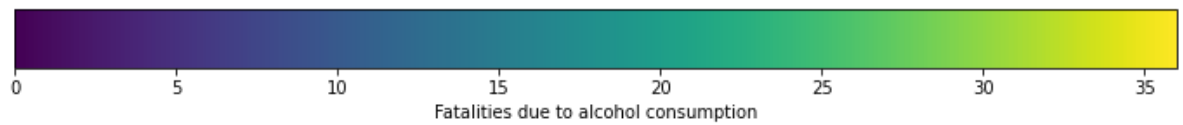
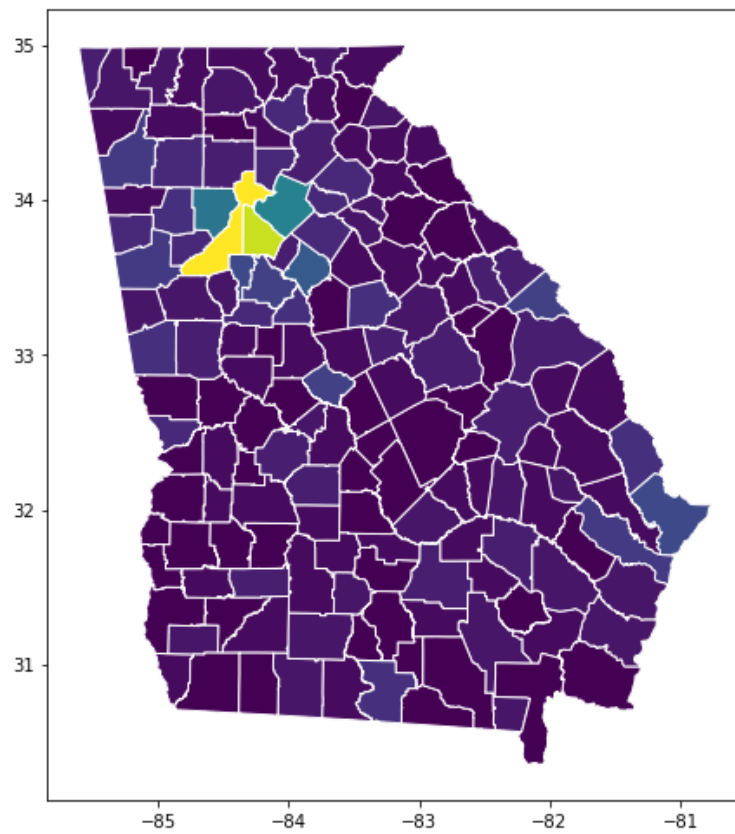


```
In [108...] #c)
```

```
In [109...] df_dxf_merge.plot('Fatality_alcoh', cmap = 'viridis',  
                             edgecolor = 'white', legend = True,  
                             figsize = (12,12),  
                             legend_kwds = {'label': 'Fatalities due to alcohol consumption',  
                                             'orientation': 'horizontal'})
```

```
Out[109]: <AxesSubplot:>
```

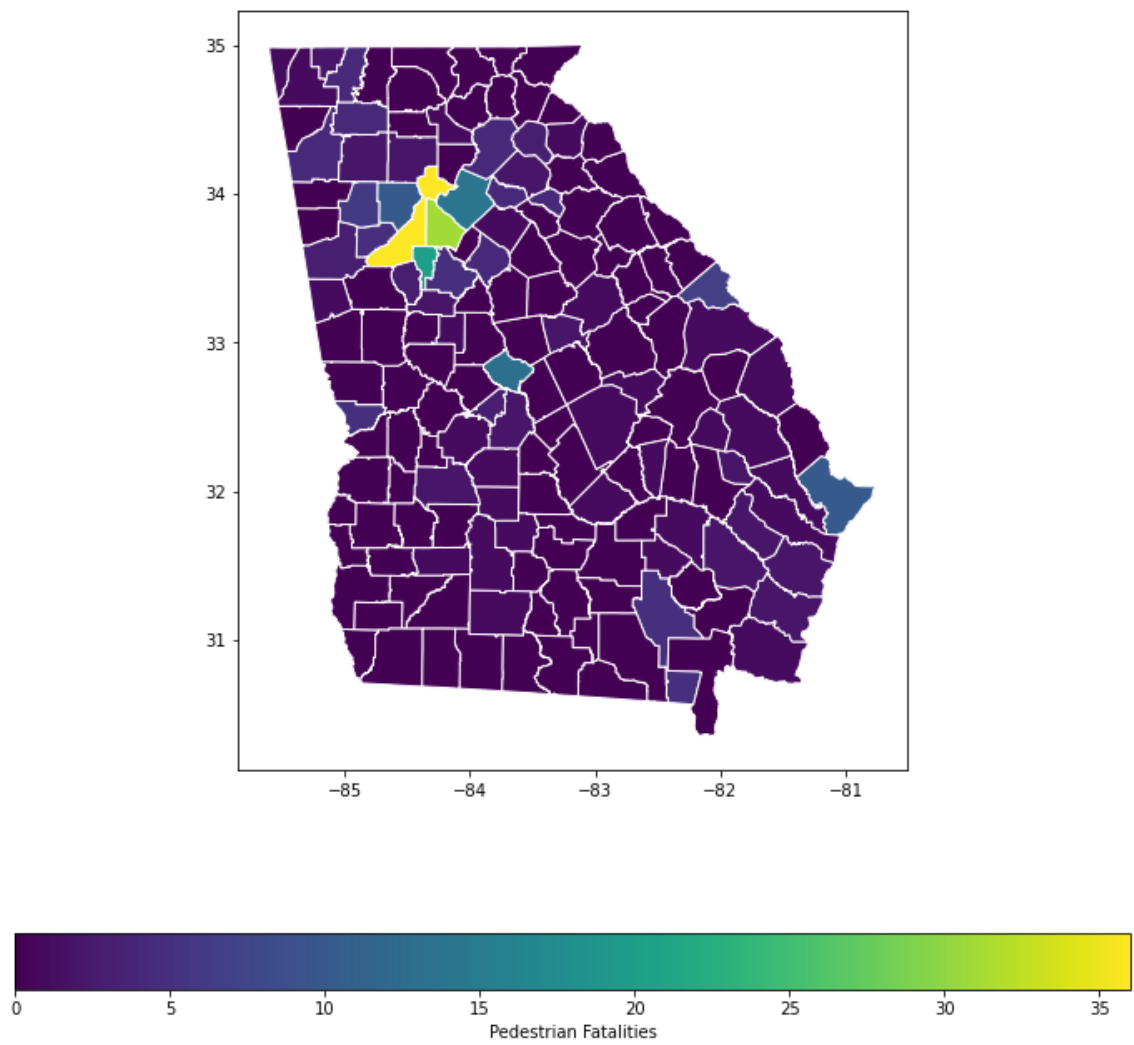




In [48]: *#d) pedestrian fatalities in counties*

```
In [110... df_dxf_merge.plot('Fatality_ped',cmap = 'viridis',
                    edgecolor = 'white', legend = True,
                    figsize = (12,12),
                    legend_kwds = {'label':'Pedestrian Fatalities',
                                  'orientation':'horizontal'})
```

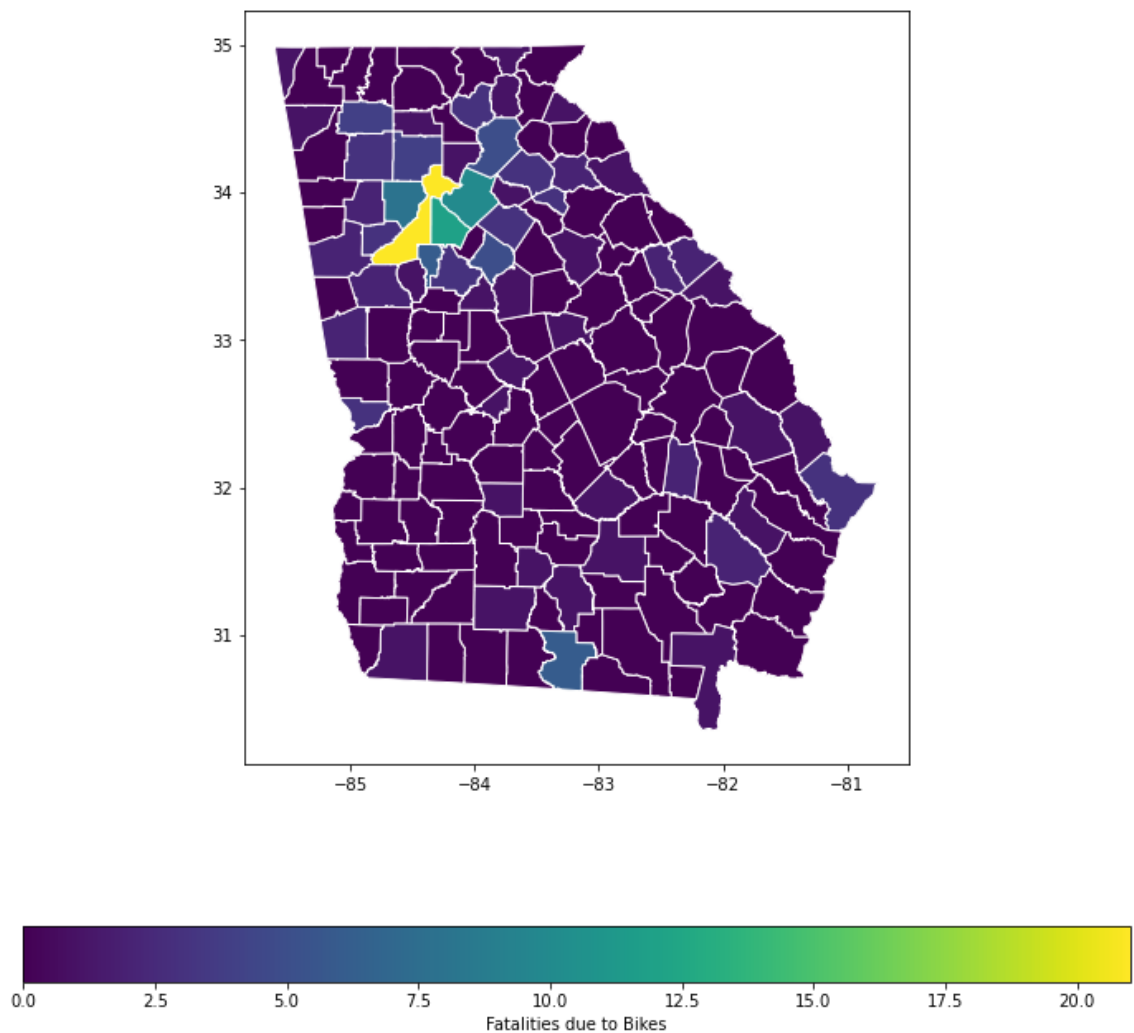
Out[110]: <AxesSubplot:>



In [ ]: e) Bike Fatality Rate

```
In [111]: df_dxf_merge.plot('Fatality_bike', cmap = 'viridis',  
                             edgecolor = 'white', legend = True,  
                             figsize = (12,12),  
                             legend_kwds = {'label': 'Fatalities due to Bikes',  
                                             'orientation': 'horizontal'})
```

Out[111]: <AxesSubplot:>



In [55]: *#f) speeding fatalities in counties*

```
In [112... df_dxf_merge.plot('Fatality_speed',cmap = 'viridis',  
                    edgecolor = 'white', legend = True,  
                    figsize = (12,12),  
                    legend_kwds = {'label':'Fatalities due Speeding',  
                                   'orientation':'horizontal'})
```

Out[112]: <AxesSubplot:>

