

In [1]:

```
import pandas as pd
```

In [2]:

```
df = pd.read_csv('deadliest_earthquakes.csv')
```

In [3]:

```
df.head()
```

Out[3]:

| | Magnitude | Location | Depth | MMI | Notes | Event | Date |
|---|-----------|---|-------|-----|--|--------------------------------|------------|
| 0 | 7.3 | Soviet Union, Turkmen Soviet Socialist Republic | 15.0 | X | Between 10,000 and 110,000 people were killed ... | 1948 Ashgabat earthquake | 05-10-1948 |
| 1 | 7.5 | Soviet Union, Tajik Soviet Socialist Republic | 18.0 | IX | 12,000 people were killed, mostly due to landslides... | 1949 Khait earthquake | 10-07-1949 |
| 2 | 8.6 | India, Assam | 15.0 | XI | It is the largest earthquake on land and the largest in the Indian subcontinent. | 1950 Assam-Tibet earthquake | 15-08-1950 |
| 3 | 6.5 | El Salvador offshore | 85.0 | NaN | 1,100 people were killed. | 1951 El Salvador earthquake | 06-05-1951 |
| 4 | 9.0 | Soviet Union, Russian Soviet Socialist Republic | 21.6 | XI | Between 2,336 and 20,000 people were killed and an estimated 100,000 were injured. | 1952 Severo-Kurilsk earthquake | 04-11-1952 |

In [4]:

```
df.tail()
```

Out[4]:

| | Magnitude | Location | Depth | MMI | Notes | E |
|----|-----------|---|-------|------|---|----------------------|
| 71 | 6.4 | Albania, Durrës | 10.0 | VIII | At least 51 people killed, 3,000 people injure... | Alb earthq |
| 72 | 7.0 | Greece TurkeyAegean Sea | 21.0 | VIII | At least 119 people killed, 1,096 people were ... | Aegean earthq |
| 73 | 7.2 | Haiti, Nippes | 10.0 | IX | At least 2,248 people killed, 12,763 people we... | 2021 earthq |
| 74 | 6.0 | Afghanistan, Khost | 10.0 | VIII | At least 1,163 people were killed and 6,027 ot... | June : Afghan earthq |
| 75 | 7.8 | Turkey, Southeastern Anatolia Syria, Aleppo an... | 17.9 | IX | More than 9,500 people killed in both Turkey a... | Tur : earthqu |



In [5]:

```
df.shape
```

Out[5]:

```
(76, 7)
```

In [6]:

```
df.columns
```

Out[6]:

```
Index(['Magnitude', 'Location', 'Depth', 'MMI', 'Notes', 'Event', 'Date'], dtype='object')
```

In [7]:

```
df.duplicated().sum()
```

Out[7]:

```
0
```

In [8]:

```
df.isnull().sum()
```

Out[8]:

```
Magnitude    0
Location      0
Depth        0
MMI           1
Notes         0
Event         0
Date          2
dtype: int64
```

In [9]:

```
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 76 entries, 0 to 75
Data columns (total 7 columns):
 #   Column      Non-Null Count  Dtype
---  -
 0   Magnitude   76 non-null    float64
 1   Location    76 non-null    object
 2   Depth       76 non-null    float64
 3   MMI         75 non-null    object
 4   Notes       76 non-null    object
 5   Event       76 non-null    object
 6   Date        74 non-null    object
dtypes: float64(2), object(5)
memory usage: 4.3+ KB
```

In [10]:

```
df.describe()
```

Out[10]:

| | Magnitude | Depth |
|-------|-----------|-----------|
| count | 76.000000 | 76.000000 |
| mean | 7.146053 | 20.823684 |
| std | 0.787475 | 17.312445 |
| min | 5.300000 | 2.000000 |
| 25% | 6.600000 | 10.000000 |
| 50% | 7.100000 | 15.000000 |
| 75% | 7.600000 | 22.675000 |
| max | 9.200000 | 90.000000 |

In [11]:

```
df.nunique()
```

Out[11]:

```
Magnitude    28
Location      72
Depth         38
MMI           9
Notes         76
Event         76
Date          74
dtype: int64
```

In [12]:

```
import matplotlib.pyplot as plt
import seaborn as sns
```

In [13]:

```
import warnings
warnings.filterwarnings('ignore')
```

In [14]:

```
df['MMI'].unique()
```

Out[14]:

```
array(['X', 'IX', 'XI', nan, 'VIII', 'VII', 'VIII &
IX', 'VI[4]',
      'VII[6]', 'VIII[7]'], dtype=object)
```

In [15]:

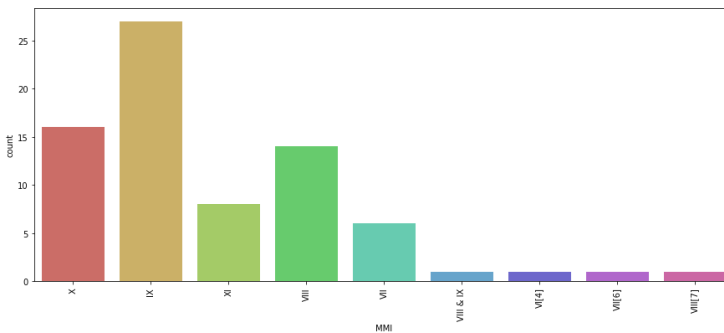
```
df['MMI'].value_counts()
```

Out[15]:

```
IX          27
X           16
VIII        14
XI           8
VII          6
VIII & IX   1
VI[4]        1
VII[6]        1
VIII[7]       1
Name: MMI, dtype: int64
```

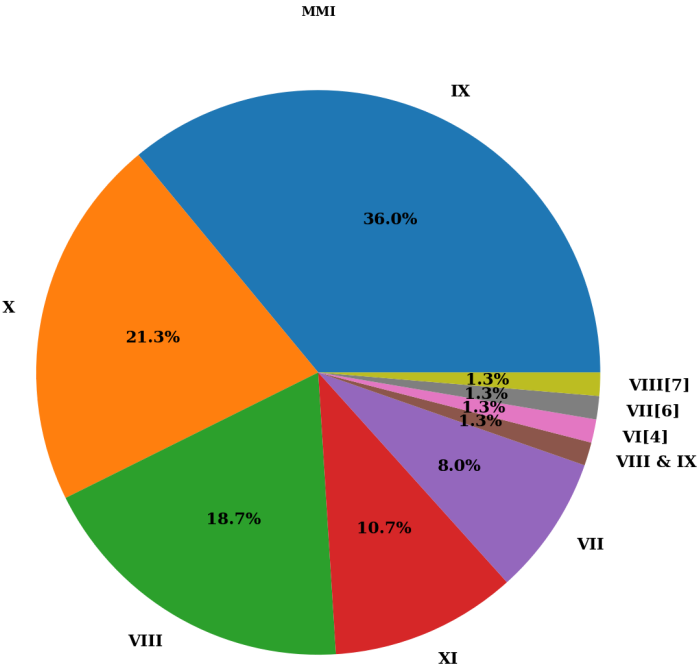
In [16]:

```
plt.figure(figsize=(15,6))
sns.countplot(df['MMI'], data = df, palette = 'hls')
plt.xticks(rotation = 90)
plt.show()
```



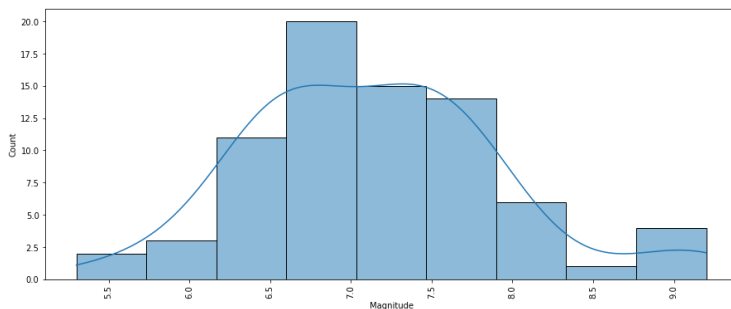
In [17]:

```
plt.figure(figsize=(30,20))
plt.pie(df['MMI'].value_counts(), labels=df['MMI'].value_counts().index,
        'color': 'black',
        'weight': 'bold',
        'family': 'serif' })
hfont = {'fontname':'serif', 'weight': 'bold'}
plt.title('MMI', size=20, **hfont)
plt.show()
```



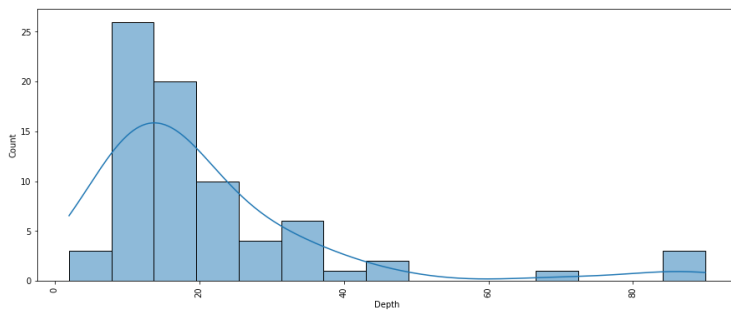
In [18]:

```
plt.figure(figsize=(15,6))
sns.histplot(df['Magnitude'], kde = True, palette = 'hls')
plt.xticks(rotation = 90)
plt.show()
```



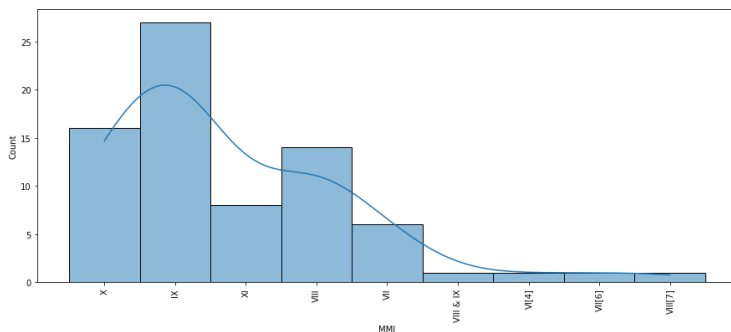
In [19]:

```
plt.figure(figsize=(15,6))
sns.histplot(df['Depth'], kde = True, palette = 'hls')
plt.xticks(rotation = 90)
plt.show()
```



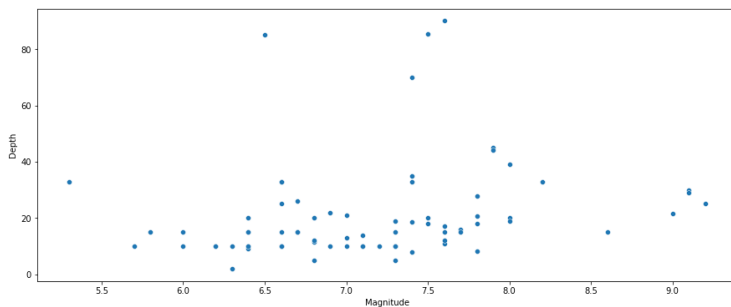
In [20]:

```
plt.figure(figsize=(15,6))
sns.histplot(df['MMI'], kde = True, palette = 'hls')
plt.xticks(rotation = 90)
plt.show()
```



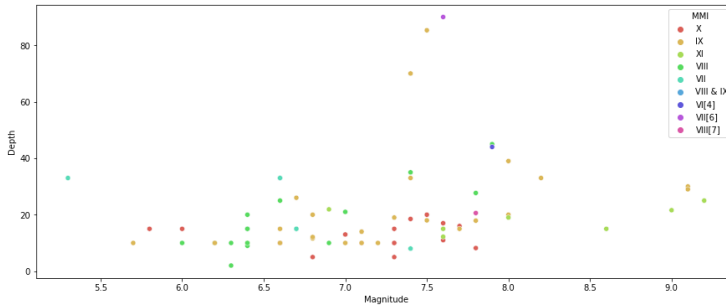
In [21]:

```
plt.figure(figsize=(15,6))
sns.scatterplot(x = df['Magnitude'], y = df['Depth'], palette = 'hls')
plt.show()
```



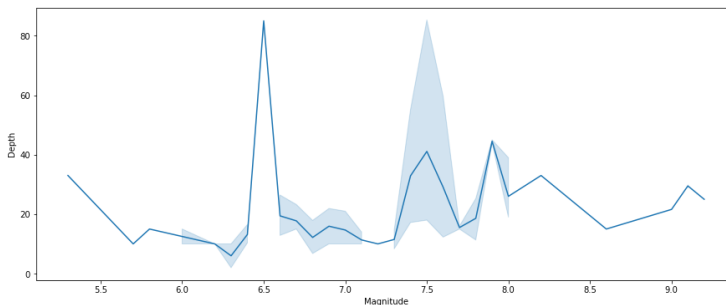
In [22]:

```
plt.figure(figsize=(15,6))
sns.scatterplot(x = df['Magnitude'], y = df['Depth'], hue = df['MMI'])
plt.show()
```



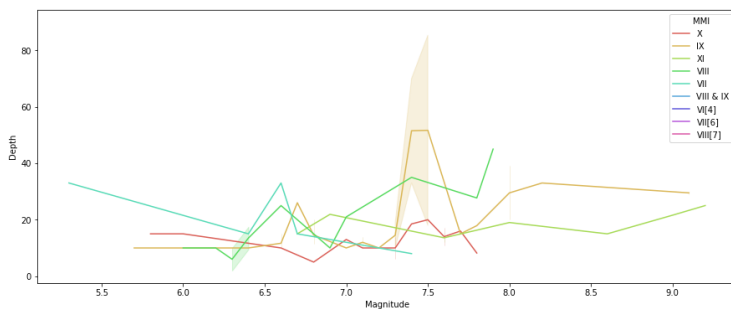
In [23]:

```
plt.figure(figsize=(15,6))
sns.lineplot(x = df['Magnitude'], y = df['Depth'], palette = 'hls')
plt.show()
```



In [24]:

```
plt.figure(figsize=(15,6))
sns.lineplot(x = df['Magnitude'], y = df['Depth'], hue = df['MMI'])
plt.show()
```



In [25]:

```
df[['Day', 'Month', 'Year']] = df['Date'].str.split('-', expand=True)
```

In [26]:

```
df_sorted_magnitude = df.sort_values('Magnitude', ascending=False)
```

In [27]:

```
df_sorted_magnitude.head()
```

Out[27]:

| | Magnitude | Location | Depth | MMI | Notes | Event | Deaths |
|----|-----------|---|-------|-----|---|------------------------------------|---------|
| 16 | 9.2 | United States, Alaska | 25.0 | XI | It is the largest earthquake ever recorded in ... | 1964 Alaska earthquake | 200 |
| 63 | 9.1 | Japan, Sendai offshore | 29.0 | IX | At least 19,747 people killed, 2,556 missing, ... | 2011 Tōhoku earthquake and tsunami | 15,000 |
| 56 | 9.1 | Indonesia, Sumatra offshore | 30.0 | IX | This is the third largest earthquake in the wo... | 2004 Indian Ocean earthquake | 227,898 |
| 4 | 9.0 | Soviet Union, Russian Soviet Socialist Republic | 21.6 | XI | Between 2,336 and 20,000 people were killed an... | 1952 Severo-Kurilsk earthquake | 1,000 |
| 2 | 8.6 | India, Assam | 15.0 | XI | It is the largest earthquake on land and the l... | 1950 Assam–Tibet earthquake | 1,000 |



In [28]:

```
df_sorted_magnitude.tail()
```

Out[28]:

| | Magnitude | Location | Depth | MMI | Notes | Event |
|----|-----------|---|-------|------|---|----------------------------------|
| 15 | 6.0 | Yugoslavia, Republic of North Macedonia | 15.0 | X | 1,070 people killed and 80 percent of Skopje w... | 1963 Skopje earthquake |
| 74 | 6.0 | Afghanistan, Khost | 10.0 | VIII | At least 1,163 people were killed and 6,027 ot... | June 2022 Afghanistan earthquake |
| 12 | 5.8 | Morocco, Souss-Massa | 15.0 | X | Worst earthquake in Moroccan history. Between ... | 1960 Agadir earthquake |
| 38 | 5.7 | El Salvador, San Salvador | 10.0 | IX | 1,000–1,500 were killed and 10,000–20,000 inju... | 1986 San Salvador earthquake |
| 41 | 5.3 | Soviet Union, Tajik Soviet Socialist Republic | 33.0 | VII | More than 274 people were killed. Most of the ... | 1989 Gissar earthquake |

In [29]:

```
df_sorted_depth = df.sort_values('Depth', ascending=False)
```

In [30]:

```
df_sorted_depth.head()
```

Out[30]:

| | Magnitude | Location | Depth | MMI | Notes | Event | C |
|----|-----------|----------------------------|-------|--------|---|---|---|
| 61 | 7.6 | Indonesia, Padang offshore | 90.0 | VII[6] | At least 1,115 people killed, 2,181 injured, 1... | 2009 Sumatra earthquake | 2 |
| 29 | 7.5 | Romania, Vrancea | 85.3 | IX | 1,578 people were killed (1,424 of them in Buc... | 1977 Vrancea earthquake | 1 |
| 3 | 6.5 | El Salvador offshore | 85.0 | NaN | 1,100 people were killed. | 1951 El Salvador earthquake | 1 |
| 17 | 7.4 | Chile, Valparaíso Region | 70.0 | IX | 400 people were killed, mostly due to a dam fa... | 1965 Valparaíso earthquake and the El Cobre da... | 1 |
| 22 | 7.9 | Peru, Ancash | 45.0 | VIII | Worst earthquake in Peruvian history. Nearly 7... | 1970 Ancash earthquake | 1 |



In [31]:

```
df_sorted_depth.tail()
```

Out[31]:

| | Magnitude | Location | Depth | MMI | Notes | Event | D |
|----|-----------|--|-------|------|---|-----------------------------|----|
| 67 | 7.8 | Nepal, Gorkha District | 8.2 | X | At least 9,182 people killed, 25,482 injured, ... | April 2015 Nepal earthquake | 21 |
| 54 | 7.4 | Afghanistan, Baghlan Province | 8.0 | VII | 1,166 people were killed and 200 people were i... | 2002 Hindu Kush earthquakes | N |
| 40 | 6.8 | Soviet Union, Armenian Soviet Socialist Republic | 5.0 | X | Between 25,000 and 50,000 were killed and up t... | 1988 Armenian earthquake | 15 |
| 11 | 7.3 | United States, Wyoming | 5.0 | X | 28 people were killed. Most of the deaths occu... | 1959 Hebgen Lake earthquake | 15 |
| 36 | 6.3 | Japan, Nagano | 2.0 | VIII | 14 people were killed, 10 were injured, and 15... | 1984 Nagano earthquake | 15 |

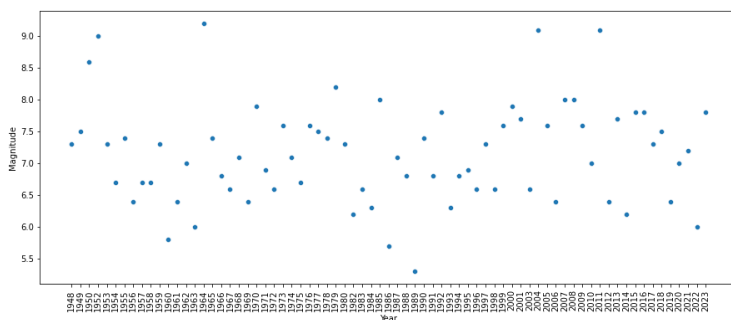


In [32]:

```
df = df.dropna()
```

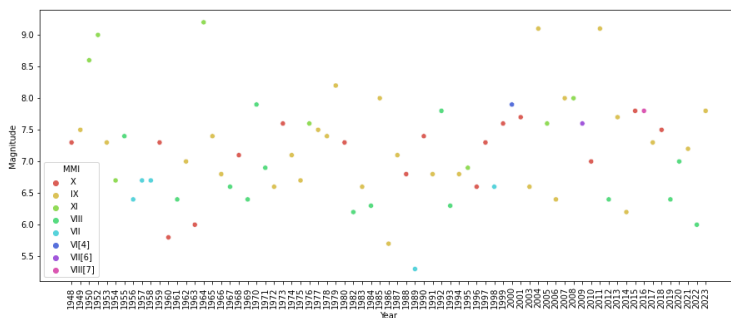
In [33]:

```
plt.figure(figsize=(15,6))
sns.scatterplot(y = df['Magnitude'], x = df['Year'], palette = 'hls')
plt.xticks(rotation = 90)
plt.show()
```



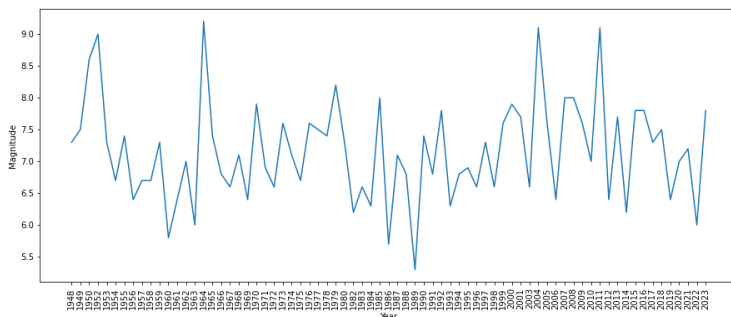
In [34]:

```
plt.figure(figsize=(15,6))
sns.scatterplot(y = df['Magnitude'], x = df['Year'], hue = df['MMI'])
plt.xticks(rotation = 90)
plt.show()
```



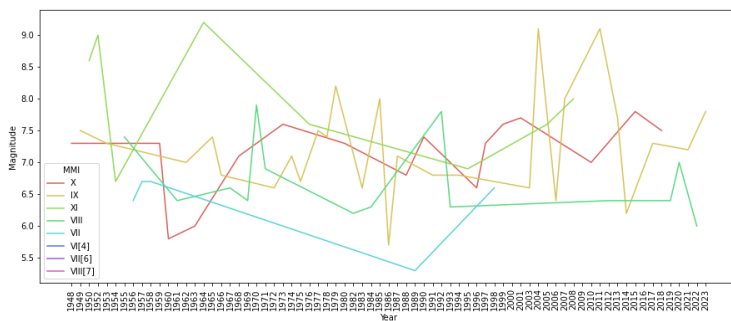
In [35]:

```
plt.figure(figsize=(15,6))
sns.lineplot(y = df['Magnitude'], x = df['Year'], palette = 'hls')
plt.xticks(rotation = 90)
plt.show()
```



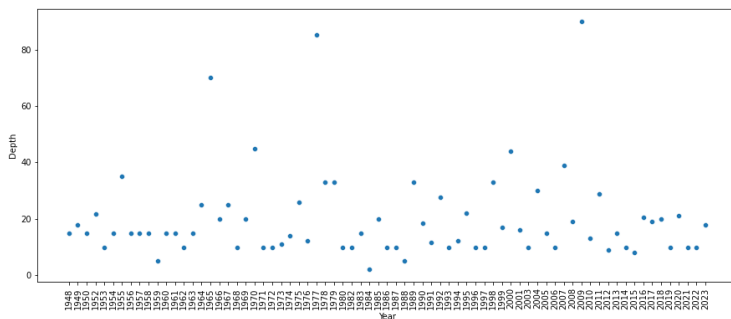
In [36]:

```
plt.figure(figsize=(15,6))
sns.lineplot(y = df['Magnitude'], x = df['Year'], hue = df['MMI'],
plt.xticks(rotation = 90)
plt.show()
```



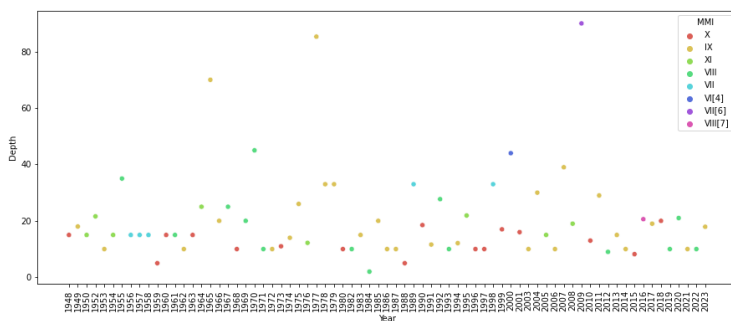
In [37]:

```
plt.figure(figsize=(15,6))
sns.scatterplot(y = df['Depth'], x = df['Year'], palette = 'hls')
plt.xticks(rotation = 90)
plt.show()
```



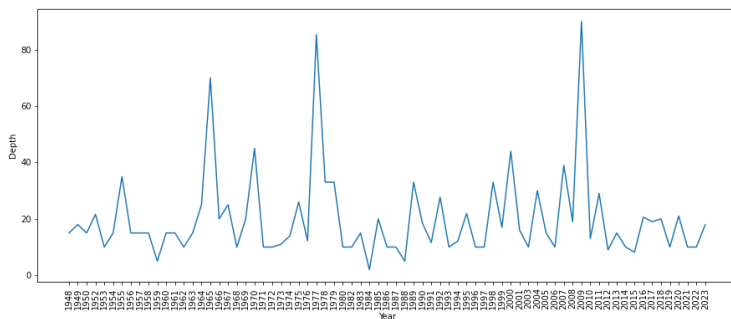
In [38]:

```
plt.figure(figsize=(15,6))
sns.scatterplot(y = df['Depth'], x = df['Year'], hue = df['MMI'], palette = 'hls')
plt.xticks(rotation = 90)
plt.show()
```



In [39]:

```
plt.figure(figsize=(15,6))
sns.lineplot(y = df['Depth'], x = df['Year'], palette = 'hls')
plt.xticks(rotation = 90)
plt.show()
```



In [40]:

```
plt.figure(figsize=(15,6))
sns.lineplot(y = df['Depth'], x = df['Year'], hue = df['MMI'], palette = 'hls')
plt.xticks(rotation = 90)
plt.show()
```

