

## Changing Sea Level in Florida

### 1 Explanatory and response variables

| Year | Height (mm) |
|------|-------------|
| 1913 | 7025        |
| 1914 | 7013        |
| 1915 | 7013        |
| 1916 | 7025        |
| 1917 | 7043        |
| 1918 | 7016        |
| 1919 | 7016        |
| 1920 | 6991        |
| 1921 | 7034        |
| 1922 | 7022        |
| 1923 | 7000        |
| 1924 | 7003        |
| 1925 | 7009        |
| 1926 | 6991        |
| 1927 | 7027        |
| 1928 | 7007        |
| 1929 | 7022        |
| 1930 | 7031        |
| 1931 | 6988        |
| 1932 | 7034        |
| 1933 | 7066        |
| 1934 | 7022        |
| 1935 | 7052        |
| 1936 | 7076        |
| 1937 | 7094        |
| 1938 | 7053        |
| 1939 | 7063        |
| 1940 | 7033        |
| 1941 | 7046        |
| 1942 | 7092        |
| 1943 | 7088        |
| 1944 | 7086        |
| 1945 | 7061        |
| 1946 | 7107        |
| 1947 | 7136        |
| 1948 | 7162        |
| 1949 | 7096        |
| 1950 | 7091        |
| 1951 | 7082        |

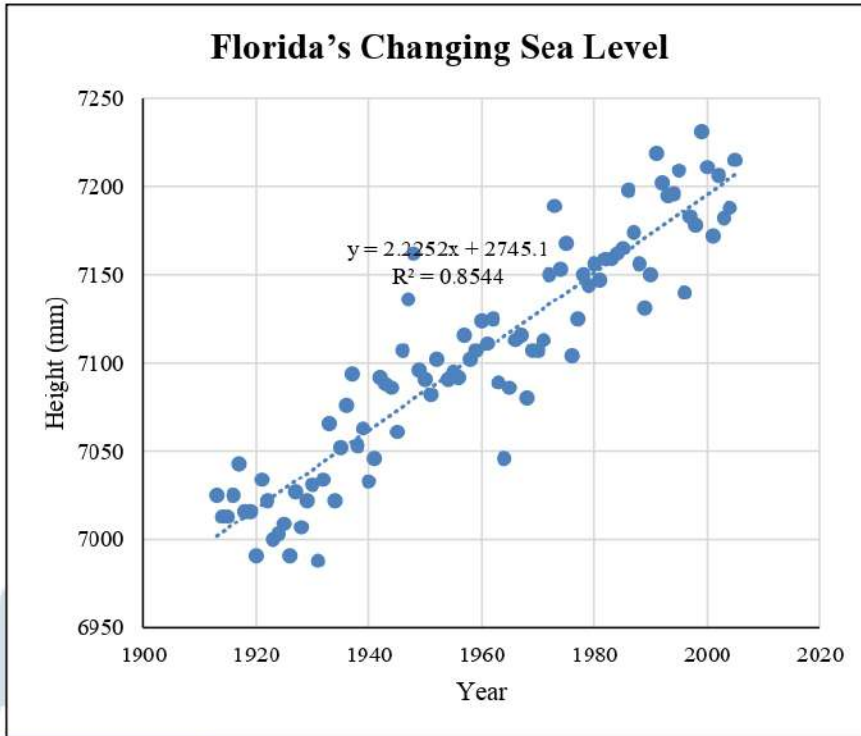
Explanatory variable

Year

Response variable

Height (mm)

### 2 Construct a scatter plot of the dataset.



### 3 What relationship is revealed by the scatter plot?

The scatter plot reveals a positive relationship as the sea level trended upwards over the covered period.

### 4

Using technology, determine the linear correlation coefficient value.

Linear correlation coefficient value.

0.9243

### 5 What type of correlation is present based on the r value?

Type of correlation based on r value

Positive  
linear  
correlation

### 6 How strong does this correlation appear to be?

strength does this correlation

Strong  
positive

|      |      |
|------|------|
| 1952 | 7102 |
| 1954 | 7091 |
| 1955 | 7095 |
| 1956 | 7092 |
| 1957 | 7116 |
| 1958 | 7102 |
| 1959 | 7107 |
| 1960 | 7124 |
| 1961 | 7111 |
| 1962 | 7125 |
| 1963 | 7089 |
| 1964 | 7046 |
| 1965 | 7086 |
| 1966 | 7113 |
| 1967 | 7116 |
| 1968 | 7080 |
| 1969 | 7107 |
| 1970 | 7107 |
| 1971 | 7113 |
| 1972 | 7150 |
| 1973 | 7189 |
| 1974 | 7153 |
| 1975 | 7168 |
| 1976 | 7104 |
| 1977 | 7125 |
| 1978 | 7150 |
| 1979 | 7144 |
| 1980 | 7156 |
| 1981 | 7147 |
| 1982 | 7159 |
| 1983 | 7159 |
| 1984 | 7162 |
| 1985 | 7165 |
| 1986 | 7198 |
| 1987 | 7174 |
| 1988 | 7156 |
| 1989 | 7131 |
| 1990 | 7150 |
| 1991 | 7219 |
| 1992 | 7202 |
| 1993 | 7195 |
| 1994 | 7196 |
| 1995 | 7209 |
| 1996 | 7140 |
| 1997 | 7183 |

correlation

7 Using technology, determine the linear regression equation.

Linear regression equation

$$\text{Height (mm)} = 2.2252(\text{year}) + 2745.0548$$

8 Using the linear regression equation, predict the sea level in Florida for the year 2010.

For 2010

7218

9

Can we use the linear regression equation to predict sea level for 2050?

No

10

Why/why not?

It is risky to extrapolate beyond the scope of the linear regression model. Even when the explanatory and response variables exhibit a strong relationship, it is not recommendable to extrapolate.

SCHOLARLY WRITINGS

|      |      |
|------|------|
| 1998 | 7178 |
| 1999 | 7231 |
| 2000 | 7211 |
| 2001 | 7172 |
| 2002 | 7206 |
| 2003 | 7182 |
| 2004 | 7188 |
| 2005 | 7215 |



# SCHOLARLY WRITINGS