

# Water\_Project\_Apr2

April 2, 2021

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[1]: from mpl_toolkits import mplot3d
import matplotlib.pyplot as plt
%matplotlib inline

import seaborn as sns
import numpy as np
import pandas as pd
```

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[2]: df = pd.read_csv('welldata_apr2.csv', parse_dates=['drilldate'])

# change drilldate to datetime format
df.index = pd.to_datetime(df['drilldate'])

# delete all rows with drill depth of 0
df = df[df['depth'] != 0]
df.dropna(subset=['drilldate'], inplace=True)

# create new column based on drilldate, made up of only the year.
df['year'] = df['drilldate'].dt.year

# new dataframe of only observations since 1980
df1980 = df[(df['year'] >= 1980)]

print(len(df1980))
print(df1980.head(5))
```

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	Registry No. (55-)	GWSI Site ID	Cadastral	Owner Name \
drilldate				
1980-01-01	85773	NaN	D17027031ADD	RICHARDS,L
1980-02-22	630770	NaN	D18027014BCC	JAGIELSKI,R L
1980-04-16	631168	NaN	D17026009BCC	CONSTANT,C D
1980-04-28	641273	NaN	D18026012DAA	HAWKINS,H L
1980-07-13	84997	NaN	D18026034BBC	JOEY SALZMAN

	Well Type	depth	Casing Depth (ft)	Case Dia (in)	drilldate \
drilldate					
1980-01-01	EXEMPT	400.0	400.0	6.0	1980-01-01

1980-02-22	EXEMPT	403.0	403.0	8.0	1980-02-22
1980-04-16	EXEMPT	480.0	440.0	6.0	1980-04-16
1980-04-28	EXEMPT	320.0	320.0	9.0	1980-04-28
1980-07-13	NON-EXEMPT	320.0	220.0	9.0	1980-07-13

drilldate	Applicaition Date	Water Level (ft)	Pump Capacity (GPM)	\
1980-01-01	9/24/1997	230.0	0.0	
1980-02-22	3/15/1982	222.0	34.0	
1980-04-16	3/25/1982	360.0	17.0	
1980-04-28	5/10/1982	180.0	0.0	
1980-07-13	7/9/1980	195.0	25.0	

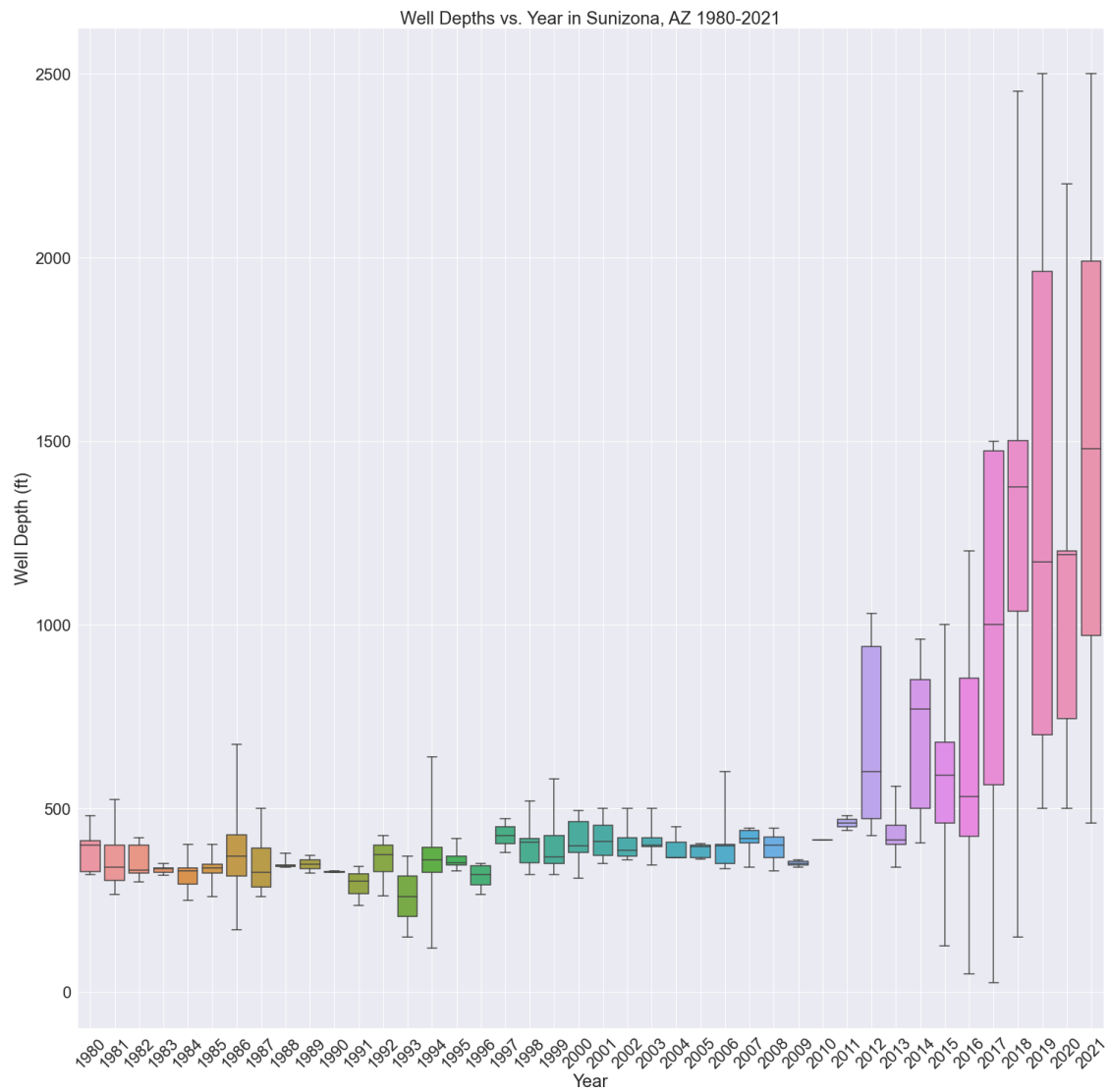
drilldate	Pump Data Available	Completion Report	Log Received	year
1980-01-01	NO	NaN	NaN	1980
1980-02-22	NO	NaN	NaN	1980
1980-04-16	NO	NaN	NaN	1980
1980-04-28	NO	NaN	NaN	1980
1980-07-13	NO	NaN	NaN	1980

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[5]: df.dtypes

fig, ax = plt.subplots(figsize=(25,25))

sns.boxplot(x=df1980['year'], y=df1980['depth'], data=df, whis=[0,100])
ax.set_title("Well Depths vs. Year in Sunizona, AZ 1980-2021")
ax.set_ylabel("Well Depth (ft)")
ax.set_xlabel("Year")
sns.set(font_scale=1)
ax.xaxis.grid(True)
plt.xticks(rotation=45)
sns.despine(trim=True, left=True)

plt.show()
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