```
In [5]:  # Dependencies and Setup
         import matplotlib.pyplot as plt
         import pandas as pd
         import numpy as np
         import requests
         import time

         # Import API key
         import api_keys

         # Incorporated citipy to determine city based on latitude and longitude
         from citipy import citipy

         # Output File (CSV)
         output_data_file = "cities.csv"

         # Range of Latitudes and Longitudes
         lat_range = (-90, 90)
         lng_range = (-180, 180)
```

Generate Cities List

```
In [7]:  # List for holding lat_lngs and cities
         lat_lngs = []
         cities = []

         # Create a set of random lat and lng combinations
         lats = np.random.uniform(low=-90.000, high=90.000, size=1500)
         print(lats)
         lngs = np.random.uniform(low=-180.000, high=180.000, size=1500)
         print(lngs)
         lat_lngs = zip(lats, lngs)
```

```
[-70.80284242  24.45066612  77.8880511  ...  79.74410754  -0.49602726
 -34.00899573]
[ 124.062451    41.62064081 -153.96853453 ...  38.49707127  -53.49068176
  179.60818409]
```

```
In [8]:  # Identify nearest city for each lat, lng combination
         cntr = 0
         for lat_lng in lat_lngs:
             city = citipy.nearest_city(lats[cntr], lngs[cntr]).city_name
             cntr = cntr + 1
             # If the city is unique, then add it to a our cities list
             if city not in cities:
                 cities.append(city)

         # Print the city count to confirm sufficient count
         len(cities)
```

```
Out[8]:  606
```

Perform API Calls

In [10]:
```python
# OpenWeatherMap API Key
api_key = api_keys.api_key

# Starting URL for Weather Map API Call

collected_data = []

base_url = "http://api.openweathermap.org/data/2.5/weather?units=Imperial&APPI
D=" + api_key
#Hide the api key
def hide_key(base_url):
    return base_url[0:47] + base_url[100:]
#Loop thru the cities and check if the data exists before appending
for city in cities:
    run_url = base_url + "&q=" + city
    print(hide_key(run_url))
    r = requests.get(run_url)
    if r.status_code == 200:
        response = requests.get(run_url).json()
#     print(response)
        collected_data.append(response)
```

```
http://api.openweathermap.org/data/2.5/weather?&q=new norfolk
http://api.openweathermap.org/data/2.5/weather?&q=buraydah
http://api.openweathermap.org/data/2.5/weather?&q=barrow
http://api.openweathermap.org/data/2.5/weather?&q=ricardo palma
http://api.openweathermap.org/data/2.5/weather?&q=taolanaro
http://api.openweathermap.org/data/2.5/weather?&q=ofaqim
http://api.openweathermap.org/data/2.5/weather?&q=olafsvik
http://api.openweathermap.org/data/2.5/weather?&q=coquimbo
http://api.openweathermap.org/data/2.5/weather?&q=viedma
http://api.openweathermap.org/data/2.5/weather?&q=busselton
http://api.openweathermap.org/data/2.5/weather?&q=punta arenas
http://api.openweathermap.org/data/2.5/weather?&q=port elizabeth
http://api.openweathermap.org/data/2.5/weather?&q=golden
http://api.openweathermap.org/data/2.5/weather?&q=ikongo
http://api.openweathermap.org/data/2.5/weather?&q=port macquarie
http://api.openweathermap.org/data/2.5/weather?&q=oranjemund
http://api.openweathermap.org/data/2.5/weather?&q=puerto ayora
http://api.openweathermap.org/data/2.5/weather?&q=awash
http://api.openweathermap.org/data/2.5/weather?&q=ushuaia
http://api.openweathermap.org/data/2.5/weather?&q=tumannyy
http://api.openweathermap.org/data/2.5/weather?&q=sobolevo
http://api.openweathermap.org/data/2.5/weather?&q=mataura
http://api.openweathermap.org/data/2.5/weather?&q=clarence town
http://api.openweathermap.org/data/2.5/weather?&q=rikitea
http://api.openweathermap.org/data/2.5/weather?&q=illoqqortoormiut
http://api.openweathermap.org/data/2.5/weather?&q=torbay
http://api.openweathermap.org/data/2.5/weather?&q=belushya guba
http://api.openweathermap.org/data/2.5/weather?&q=yellowknife
http://api.openweathermap.org/data/2.5/weather?&q=nome
http://api.openweathermap.org/data/2.5/weather?&q=saleaula
http://api.openweathermap.org/data/2.5/weather?&q=port alfred
http://api.openweathermap.org/data/2.5/weather?&q=bredasdorp
http://api.openweathermap.org/data/2.5/weather?&q=hermanus
http://api.openweathermap.org/data/2.5/weather?&q=itacoatiara
http://api.openweathermap.org/data/2.5/weather?&q=penzance
http://api.openweathermap.org/data/2.5/weather?&q=grand gaube
http://api.openweathermap.org/data/2.5/weather?&q=tuktoyaktuk
http://api.openweathermap.org/data/2.5/weather?&q=bluff
http://api.openweathermap.org/data/2.5/weather?&q=hoi an
http://api.openweathermap.org/data/2.5/weather?&q=manokwari
http://api.openweathermap.org/data/2.5/weather?&q=vestmannaeyjar
http://api.openweathermap.org/data/2.5/weather?&q=vaitupu
http://api.openweathermap.org/data/2.5/weather?&q=sambava
http://api.openweathermap.org/data/2.5/weather?&q=kununurra
http://api.openweathermap.org/data/2.5/weather?&q=cape town
http://api.openweathermap.org/data/2.5/weather?&q=buchanan
http://api.openweathermap.org/data/2.5/weather?&q=jamestown
http://api.openweathermap.org/data/2.5/weather?&q=dauphin
http://api.openweathermap.org/data/2.5/weather?&q=luderitz
http://api.openweathermap.org/data/2.5/weather?&q=cumaribo
http://api.openweathermap.org/data/2.5/weather?&q=hobart
http://api.openweathermap.org/data/2.5/weather?&q=santa isabel
http://api.openweathermap.org/data/2.5/weather?&q=guerrero negro
http://api.openweathermap.org/data/2.5/weather?&q=tarudant
http://api.openweathermap.org/data/2.5/weather?&q=balimo
http://api.openweathermap.org/data/2.5/weather?&q=constitucion
http://api.openweathermap.org/data/2.5/weather?&q=hilo
```

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http://api.openweathermap.org/data/2.5/weather?&q=axim
http://api.openweathermap.org/data/2.5/weather?&q=norman wells
http://api.openweathermap.org/data/2.5/weather?&q=leningradskiy
http://api.openweathermap.org/data/2.5/weather?&q=teguldet
http://api.openweathermap.org/data/2.5/weather?&q=qaanaaq
http://api.openweathermap.org/data/2.5/weather?&q=northam
http://api.openweathermap.org/data/2.5/weather?&q=kapaa
http://api.openweathermap.org/data/2.5/weather?&q=butaritari
http://api.openweathermap.org/data/2.5/weather?&q=atuona
http://api.openweathermap.org/data/2.5/weather?&q=codrington
http://api.openweathermap.org/data/2.5/weather?&q=coromandel
http://api.openweathermap.org/data/2.5/weather?&q=samarai
http://api.openweathermap.org/data/2.5/weather?&q=lagoa
http://api.openweathermap.org/data/2.5/weather?&q=cayenne
http://api.openweathermap.org/data/2.5/weather?&q=provideniya
http://api.openweathermap.org/data/2.5/weather?&q=upernavik
http://api.openweathermap.org/data/2.5/weather?&q=east london
http://api.openweathermap.org/data/2.5/weather?&q=aykhal
http://api.openweathermap.org/data/2.5/weather?&q=vaini
http://api.openweathermap.org/data/2.5/weather?&q=hofn
http://api.openweathermap.org/data/2.5/weather?&q=ponta do sol
http://api.openweathermap.org/data/2.5/weather?&q=cidreira
http://api.openweathermap.org/data/2.5/weather?&q=airai
http://api.openweathermap.org/data/2.5/weather?&q=dombarovskiy
http://api.openweathermap.org/data/2.5/weather?&q=nikolskoye
http://api.openweathermap.org/data/2.5/weather?&q=victoria
http://api.openweathermap.org/data/2.5/weather?&q=kirkuk
http://api.openweathermap.org/data/2.5/weather?&q=kavaratti
http://api.openweathermap.org/data/2.5/weather?&q=saskylakh
http://api.openweathermap.org/data/2.5/weather?&q=hwange
http://api.openweathermap.org/data/2.5/weather?&q=saint anthony
http://api.openweathermap.org/data/2.5/weather?&q=la ronge
http://api.openweathermap.org/data/2.5/weather?&q=kavieng
http://api.openweathermap.org/data/2.5/weather?&q=pasinler
http://api.openweathermap.org/data/2.5/weather?&q=tabiauea
http://api.openweathermap.org/data/2.5/weather?&q=hambantota
http://api.openweathermap.org/data/2.5/weather?&q=talnakh
http://api.openweathermap.org/data/2.5/weather?&q=dzaoudzi
http://api.openweathermap.org/data/2.5/weather?&q=mar del plata
http://api.openweathermap.org/data/2.5/weather?&q=roanoke rapids
http://api.openweathermap.org/data/2.5/weather?&q=sur
http://api.openweathermap.org/data/2.5/weather?&q=lebu
http://api.openweathermap.org/data/2.5/weather?&q=dasoguz
http://api.openweathermap.org/data/2.5/weather?&q=khatanga
http://api.openweathermap.org/data/2.5/weather?&q=biltine
http://api.openweathermap.org/data/2.5/weather?&q=havre-saint-pierre
http://api.openweathermap.org/data/2.5/weather?&q=urumqi
http://api.openweathermap.org/data/2.5/weather?&q=bethel
http://api.openweathermap.org/data/2.5/weather?&q=narsaq
http://api.openweathermap.org/data/2.5/weather?&q=geraldton
http://api.openweathermap.org/data/2.5/weather?&q=el alto
http://api.openweathermap.org/data/2.5/weather?&q=tonekabon
http://api.openweathermap.org/data/2.5/weather?&q=yafran
http://api.openweathermap.org/data/2.5/weather?&q=georgetown
http://api.openweathermap.org/data/2.5/weather?&q=armidale
http://api.openweathermap.org/data/2.5/weather?&q=laguna
http://api.openweathermap.org/data/2.5/weather?&q=san andres
```

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http://api.openweathermap.org/data/2.5/weather?&q=albany
http://api.openweathermap.org/data/2.5/weather?&q=carnarvon
http://api.openweathermap.org/data/2.5/weather?&q=san cristobal
http://api.openweathermap.org/data/2.5/weather?&q=yurga
http://api.openweathermap.org/data/2.5/weather?&q=nanortalik
http://api.openweathermap.org/data/2.5/weather?&q=deputatskiy
http://api.openweathermap.org/data/2.5/weather?&q=thompson
http://api.openweathermap.org/data/2.5/weather?&q=bambous virieux
http://api.openweathermap.org/data/2.5/weather?&q=namatanai
http://api.openweathermap.org/data/2.5/weather?&q=roald
http://api.openweathermap.org/data/2.5/weather?&q=perth
http://api.openweathermap.org/data/2.5/weather?&q=severo-kurilsk
http://api.openweathermap.org/data/2.5/weather?&q=vao
http://api.openweathermap.org/data/2.5/weather?&q=mutsamudu
http://api.openweathermap.org/data/2.5/weather?&q=chuy
http://api.openweathermap.org/data/2.5/weather?&q=mareeba
http://api.openweathermap.org/data/2.5/weather?&q=bac lieu
http://api.openweathermap.org/data/2.5/weather?&q=saint-pierre
http://api.openweathermap.org/data/2.5/weather?&q=iqaluit
http://api.openweathermap.org/data/2.5/weather?&q=belmonte
http://api.openweathermap.org/data/2.5/weather?&q=kupang
http://api.openweathermap.org/data/2.5/weather?&q=kenitra
http://api.openweathermap.org/data/2.5/weather?&q=bengkulu
http://api.openweathermap.org/data/2.5/weather?&q=vanimo
http://api.openweathermap.org/data/2.5/weather?&q=tasiilaq
http://api.openweathermap.org/data/2.5/weather?&q=bathsheba
http://api.openweathermap.org/data/2.5/weather?&q=marsh harbour
http://api.openweathermap.org/data/2.5/weather?&q=necochea
http://api.openweathermap.org/data/2.5/weather?&q=arraial do cabo
http://api.openweathermap.org/data/2.5/weather?&q=cherskiy
http://api.openweathermap.org/data/2.5/weather?&q=noyabrsk
http://api.openweathermap.org/data/2.5/weather?&q=baza
http://api.openweathermap.org/data/2.5/weather?&q=saint-philippe
http://api.openweathermap.org/data/2.5/weather?&q=coahuayana
http://api.openweathermap.org/data/2.5/weather?&q=ixtapa
http://api.openweathermap.org/data/2.5/weather?&q=grafton
http://api.openweathermap.org/data/2.5/weather?&q=san vicente
http://api.openweathermap.org/data/2.5/weather?&q=touros
http://api.openweathermap.org/data/2.5/weather?&q=vardo
http://api.openweathermap.org/data/2.5/weather?&q=faanui
http://api.openweathermap.org/data/2.5/weather?&q=tiksi
http://api.openweathermap.org/data/2.5/weather?&q=yian
http://api.openweathermap.org/data/2.5/weather?&q=charters towers
http://api.openweathermap.org/data/2.5/weather?&q=okhotsk
http://api.openweathermap.org/data/2.5/weather?&q=antofagasta
http://api.openweathermap.org/data/2.5/weather?&q=kieta
http://api.openweathermap.org/data/2.5/weather?&q=praia da vitoria
http://api.openweathermap.org/data/2.5/weather?&q=ingham
http://api.openweathermap.org/data/2.5/weather?&q=chokurdakh
http://api.openweathermap.org/data/2.5/weather?&q=alice springs
http://api.openweathermap.org/data/2.5/weather?&q=maloshuyka
http://api.openweathermap.org/data/2.5/weather?&q=ruzhyn
http://api.openweathermap.org/data/2.5/weather?&q=cabo san lucas
http://api.openweathermap.org/data/2.5/weather?&q=sentyabrskiy
http://api.openweathermap.org/data/2.5/weather?&q=pevek
http://api.openweathermap.org/data/2.5/weather?&q=sao filipe
http://api.openweathermap.org/data/2.5/weather?&q=rio gallegos
```

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http://api.openweathermap.org/data/2.5/weather?&q=egvekinot
http://api.openweathermap.org/data/2.5/weather?&q=avera
http://api.openweathermap.org/data/2.5/weather?&q=rurrenabaque
http://api.openweathermap.org/data/2.5/weather?&q=lompoc
http://api.openweathermap.org/data/2.5/weather?&q=solnechnyy
http://api.openweathermap.org/data/2.5/weather?&q=stonewall
http://api.openweathermap.org/data/2.5/weather?&q=canutama
http://api.openweathermap.org/data/2.5/weather?&q=moron
http://api.openweathermap.org/data/2.5/weather?&q=souillac
http://api.openweathermap.org/data/2.5/weather?&q=sakakah
http://api.openweathermap.org/data/2.5/weather?&q=kesan
http://api.openweathermap.org/data/2.5/weather?&q=salalah
http://api.openweathermap.org/data/2.5/weather?&q=port blair
http://api.openweathermap.org/data/2.5/weather?&q=goderich
http://api.openweathermap.org/data/2.5/weather?&q=zhuhai
http://api.openweathermap.org/data/2.5/weather?&q=ruatoria
http://api.openweathermap.org/data/2.5/weather?&q=pervomayskoye
http://api.openweathermap.org/data/2.5/weather?&q=grindavik
http://api.openweathermap.org/data/2.5/weather?&q=ketou
http://api.openweathermap.org/data/2.5/weather?&q=barentsburg
http://api.openweathermap.org/data/2.5/weather?&q=ilulissat
http://api.openweathermap.org/data/2.5/weather?&q=itarema
http://api.openweathermap.org/data/2.5/weather?&q=lubango
http://api.openweathermap.org/data/2.5/weather?&q=thinadhoo
http://api.openweathermap.org/data/2.5/weather?&q=prince rupert
http://api.openweathermap.org/data/2.5/weather?&q=hamilton
http://api.openweathermap.org/data/2.5/weather?&q=pathardi
http://api.openweathermap.org/data/2.5/weather?&q=yertarskiy
http://api.openweathermap.org/data/2.5/weather?&q=cedar city
http://api.openweathermap.org/data/2.5/weather?&q=qui nhon
http://api.openweathermap.org/data/2.5/weather?&q=saldanha
http://api.openweathermap.org/data/2.5/weather?&q=porbandar
http://api.openweathermap.org/data/2.5/weather?&q=chapada dos guimaraes
http://api.openweathermap.org/data/2.5/weather?&q=san policarpo
http://api.openweathermap.org/data/2.5/weather?&q=castro
http://api.openweathermap.org/data/2.5/weather?&q=mount isa
http://api.openweathermap.org/data/2.5/weather?&q=aklavik
http://api.openweathermap.org/data/2.5/weather?&q=mazatlan
http://api.openweathermap.org/data/2.5/weather?&q=verkhoyansk
http://api.openweathermap.org/data/2.5/weather?&q=hendrina
http://api.openweathermap.org/data/2.5/weather?&q=nalobikha
http://api.openweathermap.org/data/2.5/weather?&q=ribeira grande
http://api.openweathermap.org/data/2.5/weather?&q=matcha
http://api.openweathermap.org/data/2.5/weather?&q=dikson
http://api.openweathermap.org/data/2.5/weather?&q=lamu
http://api.openweathermap.org/data/2.5/weather?&q=komsomolskiy
http://api.openweathermap.org/data/2.5/weather?&q=bilma
http://api.openweathermap.org/data/2.5/weather?&q=umzimvubu
http://api.openweathermap.org/data/2.5/weather?&q=primorsk
http://api.openweathermap.org/data/2.5/weather?&q=kaitangata
http://api.openweathermap.org/data/2.5/weather?&q=lar
http://api.openweathermap.org/data/2.5/weather?&q=lasa
http://api.openweathermap.org/data/2.5/weather?&q=hovd
http://api.openweathermap.org/data/2.5/weather?&q=bialystok
http://api.openweathermap.org/data/2.5/weather?&q=wielun
http://api.openweathermap.org/data/2.5/weather?&q=kalmunai
http://api.openweathermap.org/data/2.5/weather?&q=melbourne
```

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http://api.openweathermap.org/data/2.5/weather?&q=labis
http://api.openweathermap.org/data/2.5/weather?&q=lavrentiya
http://api.openweathermap.org/data/2.5/weather?&q=rocha
http://api.openweathermap.org/data/2.5/weather?&q=morant bay
http://api.openweathermap.org/data/2.5/weather?&q=la union
http://api.openweathermap.org/data/2.5/weather?&q=yefira
http://api.openweathermap.org/data/2.5/weather?&q=hasaki
http://api.openweathermap.org/data/2.5/weather?&q=pangai
http://api.openweathermap.org/data/2.5/weather?&q=black river
http://api.openweathermap.org/data/2.5/weather?&q=padrauna
http://api.openweathermap.org/data/2.5/weather?&q=lorengau
http://api.openweathermap.org/data/2.5/weather?&q=ostrovnoy
http://api.openweathermap.org/data/2.5/weather?&q=kysyl-syr
http://api.openweathermap.org/data/2.5/weather?&q=krasnyy chikoy
http://api.openweathermap.org/data/2.5/weather?&q=tecpan
http://api.openweathermap.org/data/2.5/weather?&q=broome
http://api.openweathermap.org/data/2.5/weather?&q=palmer
http://api.openweathermap.org/data/2.5/weather?&q=mahebourg
http://api.openweathermap.org/data/2.5/weather?&q=yanacancha
http://api.openweathermap.org/data/2.5/weather?&q=el wasta
http://api.openweathermap.org/data/2.5/weather?&q=uglovskoye
http://api.openweathermap.org/data/2.5/weather?&q=marsabit
http://api.openweathermap.org/data/2.5/weather?&q=faya
http://api.openweathermap.org/data/2.5/weather?&q=londonderry
http://api.openweathermap.org/data/2.5/weather?&q=ust-kuyga
http://api.openweathermap.org/data/2.5/weather?&q=bolshoy tsaryn
http://api.openweathermap.org/data/2.5/weather?&q=carnduff
http://api.openweathermap.org/data/2.5/weather?&q=ossora
http://api.openweathermap.org/data/2.5/weather?&q=tura
http://api.openweathermap.org/data/2.5/weather?&q=nhulunbuy
http://api.openweathermap.org/data/2.5/weather?&q=eureka
http://api.openweathermap.org/data/2.5/weather?&q=slave lake
http://api.openweathermap.org/data/2.5/weather?&q=tezu
http://api.openweathermap.org/data/2.5/weather?&q=saint-joseph
http://api.openweathermap.org/data/2.5/weather?&q=baruun-urt
http://api.openweathermap.org/data/2.5/weather?&q=port lincoln
http://api.openweathermap.org/data/2.5/weather?&q=klaksvik
http://api.openweathermap.org/data/2.5/weather?&q=esperance
http://api.openweathermap.org/data/2.5/weather?&q=ancud
http://api.openweathermap.org/data/2.5/weather?&q=sechura
http://api.openweathermap.org/data/2.5/weather?&q=aranos
http://api.openweathermap.org/data/2.5/weather?&q=baykit
http://api.openweathermap.org/data/2.5/weather?&q=taungdwingyi
http://api.openweathermap.org/data/2.5/weather?&q=hailar
http://api.openweathermap.org/data/2.5/weather?&q=ereymentau
http://api.openweathermap.org/data/2.5/weather?&q=ahipara
http://api.openweathermap.org/data/2.5/weather?&q=weligama
http://api.openweathermap.org/data/2.5/weather?&q=winnemucca
http://api.openweathermap.org/data/2.5/weather?&q=zaraza
http://api.openweathermap.org/data/2.5/weather?&q=almenara
http://api.openweathermap.org/data/2.5/weather?&q=dubbo
http://api.openweathermap.org/data/2.5/weather?&q=hartlepool
http://api.openweathermap.org/data/2.5/weather?&q=takanabe
http://api.openweathermap.org/data/2.5/weather?&q=port hedland
http://api.openweathermap.org/data/2.5/weather?&q=arkhipo-osipovka
http://api.openweathermap.org/data/2.5/weather?&q=nizhneyansk
http://api.openweathermap.org/data/2.5/weather?&q=pacific grove
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http://api.openweathermap.org/data/2.5/weather?&q=opelousas
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http://api.openweathermap.org/data/2.5/weather?&q=benguela
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http://api.openweathermap.org/data/2.5/weather?&q=hoa binh
http://api.openweathermap.org/data/2.5/weather?&q=pangody
http://api.openweathermap.org/data/2.5/weather?&q=boshnyakovo
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http://api.openweathermap.org/data/2.5/weather?&q=manggar
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http://api.openweathermap.org/data/2.5/weather?&q=mount gambier
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http://api.openweathermap.org/data/2.5/weather?&q=kijang
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http://api.openweathermap.org/data/2.5/weather?&q=mandurah
http://api.openweathermap.org/data/2.5/weather?&q=kochinda
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http://api.openweathermap.org/data/2.5/weather?&q=dyshne-vedeno
http://api.openweathermap.org/data/2.5/weather?&q=tanggu
http://api.openweathermap.org/data/2.5/weather?&q=kodiak
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http://api.openweathermap.org/data/2.5/weather?&q=les cayes
http://api.openweathermap.org/data/2.5/weather?&q=byron bay
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http://api.openweathermap.org/data/2.5/weather?&q=lugoba
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http://api.openweathermap.org/data/2.5/weather?&q=sumbe
http://api.openweathermap.org/data/2.5/weather?&q=chimbote
http://api.openweathermap.org/data/2.5/weather?&q=aporawan
http://api.openweathermap.org/data/2.5/weather?&q=amderma
http://api.openweathermap.org/data/2.5/weather?&q=kibre mengist
http://api.openweathermap.org/data/2.5/weather?&q=pimentel
http://api.openweathermap.org/data/2.5/weather?&q=araguaina
http://api.openweathermap.org/data/2.5/weather?&q=pilao arcado
http://api.openweathermap.org/data/2.5/weather?&q=shchors
http://api.openweathermap.org/data/2.5/weather?&q=ampanihy
http://api.openweathermap.org/data/2.5/weather?&q=azle
http://api.openweathermap.org/data/2.5/weather?&q=sunrise manor
http://api.openweathermap.org/data/2.5/weather?&q=luancheng
http://api.openweathermap.org/data/2.5/weather?&q=kemijarvi
http://api.openweathermap.org/data/2.5/weather?&q=trat
http://api.openweathermap.org/data/2.5/weather?&q=pisco
http://api.openweathermap.org/data/2.5/weather?&q=chhukha
http://api.openweathermap.org/data/2.5/weather?&q=riyadh
http://api.openweathermap.org/data/2.5/weather?&q=yatou
http://api.openweathermap.org/data/2.5/weather?&q=matagami
http://api.openweathermap.org/data/2.5/weather?&q=vryburg
http://api.openweathermap.org/data/2.5/weather?&q=whitehorse
http://api.openweathermap.org/data/2.5/weather?&q=prainha
```

In [11]:
```
#collected_data
#collected_data_saved = collected_data
len(collected_data)
#collected_data
```

Out[11]: 531

In [ ]:

In [12]:
```python
# Use list comprehension to gather necessary data series

lat_data = [data.get("coord").get("lat") for data in collected_data]
lng_data = [data.get("coord").get("lon") for data in collected_data]
temp_data = [data.get("main").get("temp") for data in collected_data]
humid_data = [data.get("main").get("humidity") for data in collected_data]
cloud_data =[data.get("clouds").get("all") for data in collected_data]
wind_data = [data.get("wind").get("speed") for data in collected_data]
validcities = [data.get("name") for data in collected_data]
countryList = [data.get("country") for data in collected_data]
```

In [13]:
```python
# Create data frame with aggregated data
weather_data = pd.DataFrame({"cityName":validcities,
                             "country":countryList,
                             "lat":lat_data,
                             "lng":lng_data,
                             "temp":temp_data,
                             "humidity":humid_data,
                             "cloudiness":cloud_data,
                             "winds":wind_data})

# re order columns
weather_data = weather_data[["cityName","country","lat","lng","temp","humidit
y","cloudiness","winds"]]
weather_data.head()
```

Out[13]:

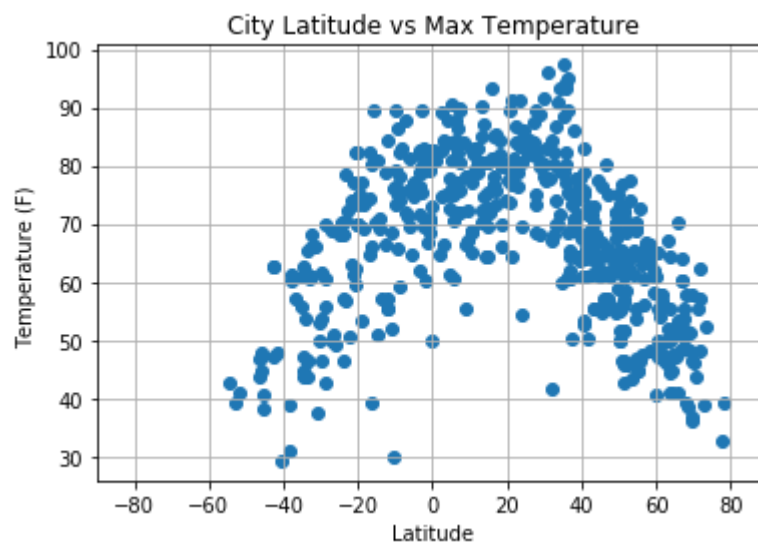|	cityName	country	lat	lng	temp	humidity	cloudiness	winds
0	New Norfolk	None	-42.78	147.06	62.60	42	0	11.41
1	Buraydah	None	26.33	43.97	84.20	32	0	4.63
2	Barrow	None	-38.31	-60.23	31.09	86	0	3.18
3	Ricardo Palma	None	-11.92	-76.67	55.39	77	8	2.62
4	Ofaqim	None	31.31	34.62	77.80	79	92	6.98

In [14]:
```python
# Save weather data to csv file
weather_data.to_csv(output_data_file, encoding="utf-8", index=False)
```

In [15]:
```python
# Build a scatter plot for each data type

# Latitude vs Max Temp
plt.scatter(weather_data["lat"], weather_data["temp"], marker="o")

# Add chart labels
plt.title("City Latitude vs Max Temperature")
plt.ylabel("Temperature (F) ")
plt.xlabel("Latitude")
plt.grid(True)
plt.xlim(-90,90)

# Save the figure
plt.savefig("Lat_vs_MaxTemp.png")
# Show plot
plt.show()
```
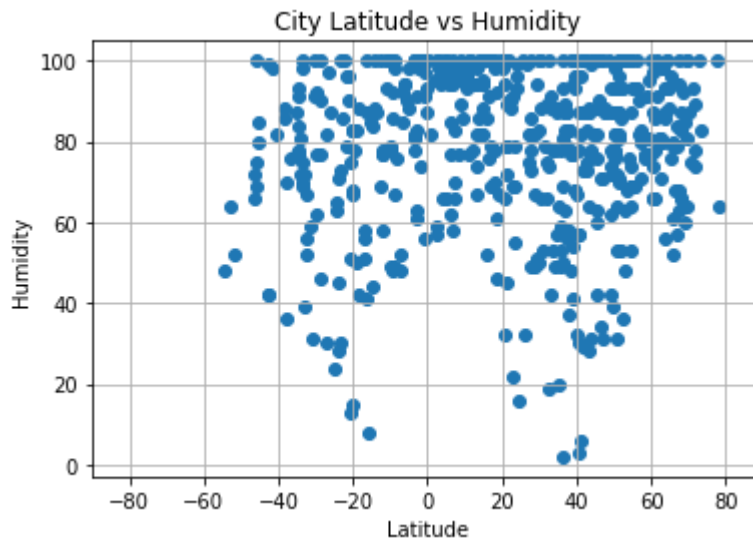
In [16]:
```python
# Latitude vs Humidity
plt.scatter(weather_data["lat"], weather_data["humidity"], marker="o")

# Add chart labels
plt.title("City Latitude vs Humidity")
plt.ylabel("Humidity")
plt.xlabel("Latitude")
plt.grid(True)
plt.xlim(-90,90)

# Save the figure
plt.savefig("Lat_vs_Humidity.png")

# Show plot
plt.show()
```
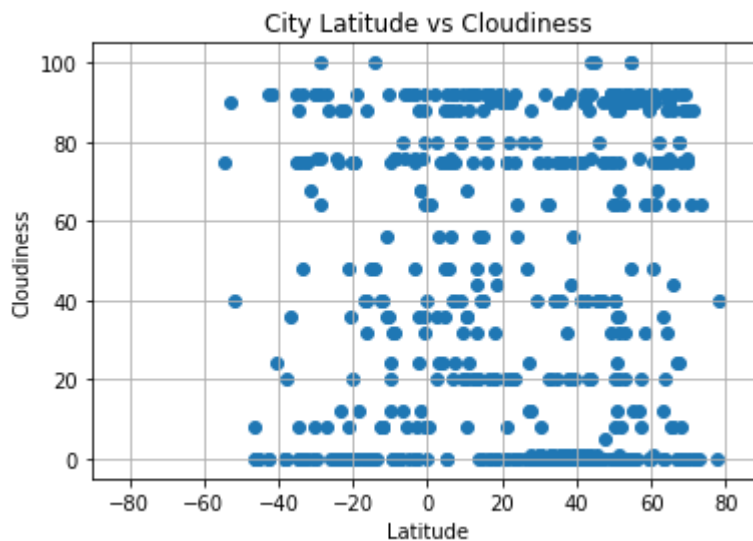
In [17]:
```python
# Latitude vs Cloudiness
plt.scatter(weather_data["lat"], weather_data["cloudiness"], marker="o")

# Add chart labels
plt.title("City Latitude vs Cloudiness")
plt.ylabel("Cloudiness")
plt.xlabel("Latitude")
plt.grid(True)
plt.xlim(-90,90)

# Save the figure
plt.savefig("Lat_vs_Cloudiness.png")

# Show plot
plt.show()
```


City Latitude vs Cloudiness

In [18]:
```python
# Latitude vs Wind Speed
plt.scatter(weather_data["lat"], weather_data["winds"], marker="o")

# Add chart labels
plt.title("City Latitude vs Wind Speed")
plt.ylabel("Wind Speed (mph)")
plt.xlabel("Latitude")
plt.grid(True)
plt.xlim(-90,90)

# Save the figure
plt.savefig("Lat_vs_WindSpeed.png")

# Show plot
plt.show()
```


City Latitude vs Wind Speed