Actividad 3

February 14, 2018

In [1]:
```
# Cargar a la memoria de trabajo las bibliotecas: Pandas (manejo de datos,
# Numpy (numerical python) y la biblioteca de gráficas Matplotlib
# Se asignan nombres cortos.
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
```

In [2]:
```
# Lee un archivo de texto con la función Pandas
# Se leerá el archivo del 22 de Junio de 2017
df1 = pd.read_csv('DatosJun.txt', skiprows=5, sep='\s+')
# Se leerá el archivo del 22 de Diciembre de 2017
df2 = pd.read_csv('DatosDic.txt', skiprows=5, sep='\s+')
# Nombramos las columnas
df1.columns = ['PRES','HGHT','TEMP','DWPT','RELH','MIXR','DRCT','SKNT','THTA','THTE','TH
df2.columns = ['PRES','HGHT','TEMP','DWPT','RELH','MIXR','DRCT','SKNT','THTA','THTE','TH
```

In [3]:
```
df1
```

Out[3]:

	PRES	HGHT	TEMP	DWPT	RELH	MIXR	DRCT	SKNT	THTA	THTE	THTV
0	1002.0	121	15.0	13.4	90	9.73	283.0	11.0	288.0	315.4	289.7
1	1000.0	137	14.8	13.1	90	9.56	280.0	12.0	287.9	314.8	289.6
2	996.0	171	14.6	12.6	88	9.27	280.0	15.0	288.1	314.2	289.7
3	993.0	197	14.4	12.2	87	9.06	280.0	16.0	288.1	313.7	289.7
4	990.0	222	14.2	12.6	90	9.35	280.0	17.0	288.1	314.5	289.8
5	988.0	239	14.0	12.9	93	9.55	282.0	17.0	288.1	315.0	289.8
6	980.0	308	13.7	11.5	87	8.79	290.0	16.0	288.5	313.4	290.0
7	978.0	325	13.6	11.2	85	8.61	290.0	16.0	288.6	312.9	290.1
8	968.0	412	12.9	11.0	88	8.58	290.0	15.0	288.8	313.1	290.2
9	954.0	534	12.0	10.7	92	8.53	279.0	15.0	289.0	313.2	290.5
10	949.0	579	11.8	10.2	90	8.30	275.0	15.0	289.2	312.8	290.7
11	935.0	703	11.2	8.8	85	7.65	278.0	14.0	289.9	311.8	291.2
12	925.0	793	10.4	8.9	90	7.79	280.0	14.0	289.9	312.2	291.3
13	923.0	811	10.2	8.9	91	7.80	280.0	13.0	289.9	312.2	291.3
14	915.0	883	9.6	8.8	95	7.85	285.0	12.0	290.0	312.5	291.4
15	905.0	975	8.8	8.8	100	7.91	297.0	14.0	290.1	312.7	291.5
16	902.0	1002	8.7	8.7	100	7.87	300.0	14.0	290.3	312.8	291.6
17	895.0	1067	8.4	8.4	100	7.78	300.0	16.0	290.6	312.9	292.0
18	885.0	1160	8.0	8.0	100	7.66	283.0	19.0	291.1	313.1	292.5

```
19    884.0   1169   8.0   7.9    99  7.61  282.0   19.0  291.2  313.1  292.6
20    883.0   1178   8.2   7.6    96  7.46  280.0   19.0  291.5  313.0  292.8
21    878.0   1225   9.2   6.0    80  6.72  282.0   20.0  293.0  312.6  294.2
22    874.0   1263  11.6   5.6    67  6.56  283.0   20.0  295.9  315.3  297.1
23    870.0   1302  12.2   4.5    59  6.09  285.0   21.0  296.9  315.0  298.0
24    867.0   1331  12.6   3.6    54  5.75  285.0   20.0  297.6  314.9  298.7
25    863.0   1370  12.6   1.6    47  5.00  285.0   19.0  298.0  313.1  298.9
26    856.0   1438  12.6   2.6    51  5.42  285.0   17.0  298.7  315.1  299.7
27    853.0   1467  12.9   1.4    45  4.99  285.0   16.0  299.3  314.5  300.2
28    852.0   1477  13.0   1.0    44  4.85  283.0   17.0  299.6  314.3  300.4
29    850.0   1497  13.0   0.0    41  4.52  280.0   18.0  299.8  313.6  300.6
..      ...    ...   ...   ...   ...   ...    ...    ...    ...    ...    ...
199    30.0  24210 -52.7 -89.7     0  0.00  215.0   12.0  600.4  600.4  600.4
200    28.0  24656 -51.9 -88.9     0  0.01  145.0    3.0  614.5  614.6  614.5
201    27.5  24773 -51.7 -88.7     0  0.01  185.0    5.0  618.3  618.3  618.3
202    26.0  25136 -52.5 -89.5     0  0.01  310.0   10.0  626.0  626.0  626.0
203    25.2  25338 -50.5 -88.5     0  0.01   10.0   17.0  637.3  637.4  637.3
204    25.0  25390 -50.5 -88.5     0  0.01   25.0   19.0  638.7  638.8  638.7
205    24.0  25656 -50.7 -88.7     0  0.01   75.0   28.0  645.8  645.9  645.8
206    23.7  25738 -50.7 -88.7     0  0.01   78.0   25.0  648.0  648.1  648.0
207    23.0  25935 -50.2 -88.4     0  0.01   85.0   19.0  655.0  655.0  655.0
208    21.0  26530 -48.9 -87.6     0  0.01   65.0   16.0  676.4  676.5  676.4
209    20.0  26850 -48.1 -87.1     0  0.01   90.0   30.0  688.2  688.3  688.2
210    19.9  26883 -48.1 -87.1     0  0.01   90.0   29.0  689.2  689.3  689.2
211    19.0  27191 -45.4 -85.1     0  0.02   90.0   21.0  706.6  706.8  706.6
212    18.5  27368 -43.9 -83.9     0  0.02  102.0   19.0  716.8  717.0  716.8
213    18.0  27553 -43.2 -83.5     0  0.02  115.0   16.0  724.7  725.0  724.7
214    17.0  27939 -41.7 -82.6     0  0.03  120.0   15.0  741.5  741.8  741.5
215    16.9  27978 -41.5 -82.5     0  0.03  119.0   15.0  743.3  743.6  743.3
216    16.0  28348 -42.2 -82.8     0  0.03  105.0   20.0  752.8  753.1  752.9
217    15.0  28784 -42.9 -83.0     0  0.03  115.0    9.0  764.3  764.6  764.3
218    14.8  28875 -43.1 -83.1     0  0.03  116.0   10.0  766.7  767.0  766.7
219    14.0  29251 -42.8 -82.9     0  0.03  120.0   12.0  780.1  780.5  780.1
220    12.0  30294 -41.8 -82.4     0  0.04  115.0   18.0  818.6  819.1  818.6
221    11.0  30883 -41.2 -82.1     0  0.04   90.0   14.0  841.2  841.8  841.2
222    10.4  31263 -40.9 -81.9     0  0.05  108.0   16.0  856.1  856.7  856.1
223    10.0  31530 -39.7 -80.7     0  0.06  120.0   17.0  870.2  871.0  870.2
224     9.0  32259 -35.5 -78.6     0  0.09   95.0   20.0  912.9  914.2  913.0
225     8.6  32574 -33.7 -77.7     0  0.11   95.0   24.0  931.9  933.4  931.9
226     8.0  33082 -33.1 -77.1     0  0.13   95.0   30.0  953.7  955.5  953.8
227     7.8  33259 -32.9 -76.9     0  0.14  961.4  963.4  961.5    NaN    NaN
228     7.6  33442 -33.1 -77.1     0  0.14  967.8  969.8  967.9    NaN    NaN

[229 rows x 11 columns]
```

In [4]:
```
df2
```

Out[4]:
```
      PRES   HGHT  TEMP  DWPT   RELH  MIXR   DRCT  SKNT    THTA    THTE  \
0   1012.0    202  10.0  10.0  100.0  7.65  325.0  13.0   282.1   303.3
```

1	1000.0	301	9.4	9.4	100.0	7.45	340.0	14.0	282.6	303.2
2	993.0	359	9.1	9.1	100.0	7.35	350.0	15.0	282.8	303.2
3	986.0	418	8.8	8.8	100.0	7.25	355.0	15.0	283.1	303.2
4	975.0	510	8.3	8.3	100.0	7.09	345.0	13.0	283.5	303.2
5	961.0	630	7.7	7.7	100.0	6.88	350.0	11.0	284.0	303.3
6	951.0	716	7.2	7.2	100.0	6.74	325.0	12.0	284.4	303.3
7	946.0	760	7.0	7.0	100.0	6.67	325.0	13.0	284.6	303.3
8	938.0	830	6.6	6.6	100.0	6.56	337.0	14.0	284.9	303.4
9	933.0	874	6.6	6.4	98.0	6.49	345.0	15.0	285.4	303.6
10	925.0	945	6.6	6.0	96.0	6.38	345.0	14.0	286.1	304.1
11	924.0	954	6.6	5.8	95.0	6.29	344.0	14.0	286.1	304.0
12	915.0	1034	6.3	5.4	94.0	6.17	335.0	14.0	286.6	304.2
13	902.0	1151	5.8	4.8	93.0	6.00	335.0	16.0	287.3	304.4
14	892.0	1243	5.4	4.3	93.0	5.87	346.0	17.0	287.8	304.6
15	884.0	1317	5.6	4.4	92.0	5.96	355.0	17.0	288.7	305.8
16	882.0	1335	5.6	4.4	92.0	5.98	355.0	17.0	288.9	306.1
17	873.0	1419	5.4	2.8	84.0	5.40	355.0	18.0	289.6	305.2
18	860.0	1542	5.1	0.5	72.0	4.65	10.0	19.0	290.5	304.1
19	857.0	1570	5.0	0.0	70.0	4.49	11.0	19.0	290.7	303.9
20	853.0	1608	4.8	-5.2	48.0	3.06	13.0	18.0	290.9	300.1
21	852.0	1618	4.8	-6.2	45.0	2.84	14.0	18.0	291.0	299.5
22	850.0	1637	5.0	-11.0	30.0	1.95	15.0	18.0	291.4	297.4
23	849.0	1647	5.0	-15.0	22.0	1.41	16.0	18.0	291.5	295.9
24	848.0	1656	5.2	-15.8	20.0	1.32	16.0	18.0	291.8	296.0
25	842.0	1714	7.2	-20.8	12.0	0.87	19.0	18.0	294.5	297.3
26	840.0	1734	7.6	-18.9	13.0	1.03	20.0	18.0	295.1	298.4
27	838.0	1753	8.0	-17.0	15.0	1.21	19.0	18.0	295.7	299.6
28	835.0	1783	7.8	-15.2	18.0	1.41	18.0	19.0	295.8	300.3
29	828.0	1852	7.4	-16.6	16.0	1.27	16.0	20.0	296.1	300.2
..	...	...	...	...	...	...	...	...	...	...
169	21.4	25294	-74.5	-94.5	3.0	0.00	312.0	38.0	595.8	595.8
170	20.0	25690	-72.9	-94.9	2.0	0.00	305.0	40.0	612.3	612.4
171	19.0	25991	-72.5	-94.5	2.0	0.00	295.0	37.0	622.7	622.7
172	18.1	26275	-72.1	-94.1	2.0	0.00	304.0	38.0	632.6	632.6
173	17.2	26574	-73.9	-94.9	3.0	0.00	313.0	39.0	636.1	636.1
174	17.0	26642	-73.4	-94.9	3.0	0.00	315.0	39.0	639.8	639.9
175	16.8	26711	-72.9	-94.9	2.0	0.00	312.0	40.0	643.6	643.6
176	16.0	26996	-74.3	-95.3	3.0	0.00	300.0	44.0	648.1	648.1
177	15.0	27372	-73.8	-95.4	2.0	0.00	300.0	50.0	661.8	661.8
178	14.4	27609	-73.5	-95.5	2.0	0.00	300.0	48.0	670.6	670.6
179	12.0	28668	-75.2	-96.3	3.0	0.00	300.0	39.0	700.5	700.5
180	11.6	28865	-75.5	-96.5	3.0	0.00	300.0	44.0	706.2	706.2
181	11.0	29177	-72.4	-96.0	2.0	0.00	300.0	52.0	728.3	728.4
182	10.3	29564	-68.5	-95.5	1.0	0.00	290.0	47.0	756.4	756.5
183	10.0	29740	-69.3	-94.3	2.0	0.01	285.0	45.0	759.9	759.9
184	9.9	29800	-69.7	-94.7	2.0	0.01	286.0	46.0	760.6	760.6
185	9.1	30304	-67.5	-94.5	1.0	0.01	298.0	58.0	787.5	787.6
186	9.0	30371	-67.7	-94.7	1.0	0.01	300.0	59.0	789.4	789.5

187	8.5	30714	-68.5	-95.5	1.0	0.01	293.0	64.0	799.1	799.2
188	8.0	31081	-64.1	-94.1	1.0	0.01	285.0	69.0	830.5	830.6
189	7.1	31807	-66.5	-93.5	1.0	0.01	285.0	62.0	849.5	849.6
190	7.0	31895	-66.2	-93.4	1.0	0.01	285.0	61.0	854.3	854.4
191	6.0	32847	-62.7	-92.3	1.0	0.01	270.0	77.0	907.7	907.9
192	5.0	33973	-58.6	-91.0	1.0	0.02	295.0	84.0	974.8	975.1
193	4.8	34226	-57.7	-90.7	1.0	0.02	289.0	88.0	990.5	990.8
194	4.7	34358	-58.1	-91.1	1.0	0.02	285.0	91.0	994.6	994.9
195	4.6	34494	-55.9	-89.9	1.0	0.03	282.0	93.0	1011.0	1011.4
196	4.4	34777	-55.8	-89.8	1.0	0.03	275.0	98.0	1024.5	1025.0
197	4.3	34923	-55.7	-89.7	1.0	0.03	275.0	98.0	1031.6	1032.1
198	4.0	275	98.0	NaN	NaN	NaN	NaN	NaN	NaN	NaN

	THTV
0	283.4
1	283.8
2	284.1
3	284.3
4	284.7
5	285.2
6	285.6
7	285.8
8	286.0
9	286.5
10	287.1
11	287.2
12	287.7
13	288.3
14	288.8
15	289.7
16	290.0
17	290.5
18	291.3
19	291.5
20	291.4
21	291.5
22	291.7
23	291.7
24	292.0
25	294.6
26	295.3
27	295.9
28	296.1
29	296.3
..	...
169	595.8
170	612.3
171	622.7

```
172   632.6
173   636.1
174   639.8
175   643.6
176   648.1
177   661.8
178   670.6
179   700.5
180   706.2
181   728.3
182   756.4
183   759.9
184   760.6
185   787.5
186   789.4
187   799.1
188   830.6
189   849.5
190   854.3
191   907.7
192   974.8
193   990.5
194   994.6
195  1011.0
196  1024.5
197  1031.6
198     NaN

[199 rows x 11 columns]
```

In [5]:
```
# Eliminamos datos incompletos
df1 = df1.drop(df1.index[len(df1)-2])
df2 = df2.drop(df2.index[len(df2)-1])
```

In [6]:
```
# Tipo de datos (Junio)
df1.dtypes
```

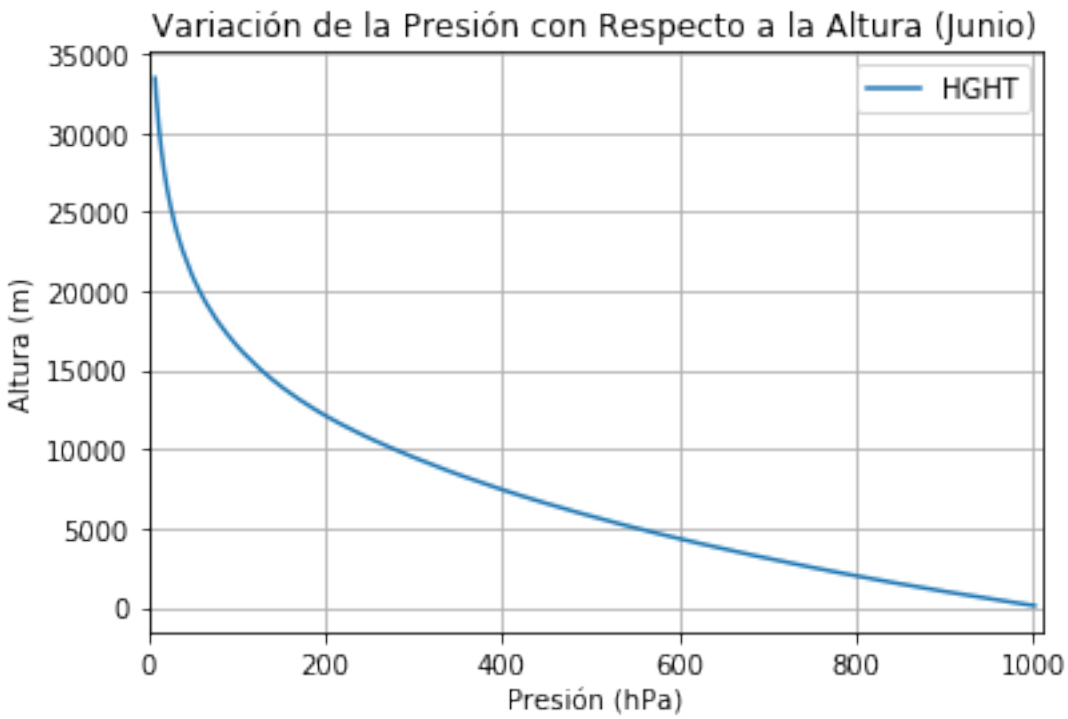
Out[6]:
```
PRES    float64
HGHT      int64
TEMP    float64
DWPT    float64
RELH      int64
MIXR    float64
DRCT    float64
SKNT    float64
THTA    float64
THTE    float64
THTV    float64
dtype: object
```

In [7]:
```
# Tipo de datos (Diciembre)
df2.dtypes
```

Out[7]:
```
PRES    float64
HGHT      int64
TEMP    float64
DWPT    float64
RELH    float64
MIXR    float64
DRCT    float64
SKNT    float64
THTA    float64
THTE    float64
THTV    float64
dtype: object
```

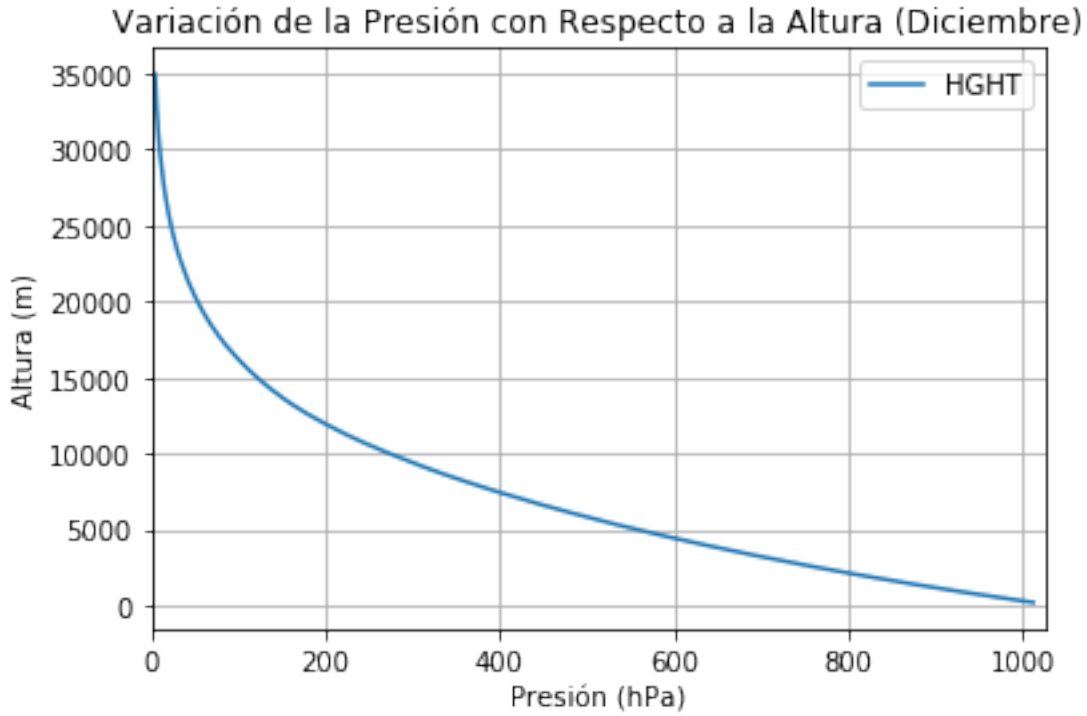
In [8]:
```
# Graficamos la variación de la presión con respecto a la altura (Junio)
df01 = df1[['HGHT','PRES']]
plt.figure(); df01.plot(x='PRES');plt.legend(loc='best')
plt.title('Variación de la Presión con Respecto a la Altura (Junio)')
plt.xlim([0,1010])
plt.xlabel('Presión (hPa)')
plt.ylabel('Altura (m)')
plt.grid(True)
plt.show()
```

```
<matplotlib.figure.Figure at 0x1e9933f1da0>
```



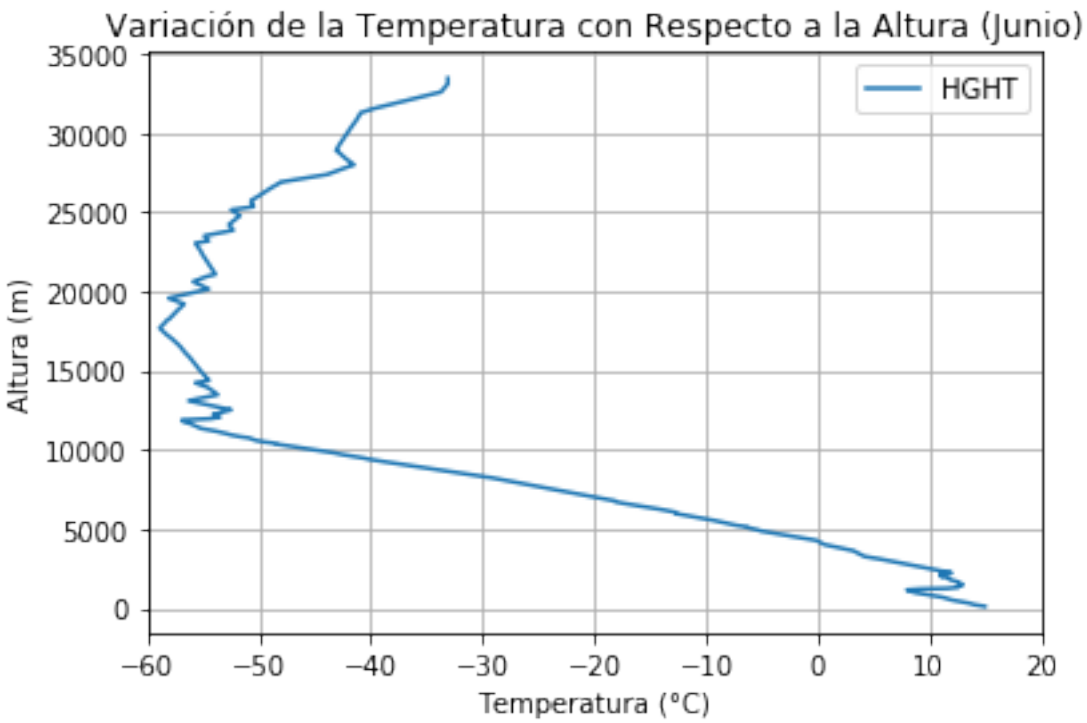
In [9]:
```
# Graficamos la variación de la presión con respecto a la altura (Diciembre)
df02 = df2[['HGHT','PRES']]
plt.figure(); df02.plot(x='PRES');plt.legend(loc='best')
plt.title('Variación de la Presión con Respecto a la Altura (Diciembre)')
plt.xlim([0,1025])
plt.xlabel('Presión (hPa)')
plt.ylabel('Altura (m)')
plt.grid(True)
plt.show()
```

```
<matplotlib.figure.Figure at 0x1e993513320>
```



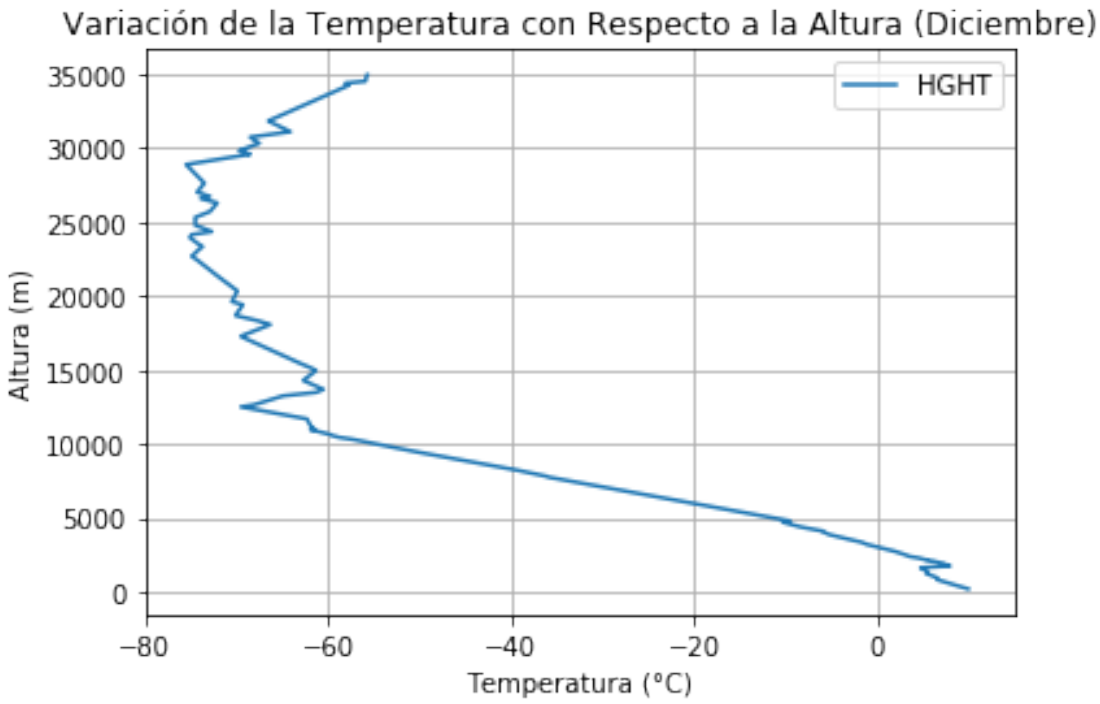
In [10]:
```
# Graficamos la variación de la temperatura con respecto a la altura (Junio)
df01 = df1[['HGHT','TEMP']]
plt.figure(); df01.plot(x='TEMP');plt.legend(loc='best')
plt.title('Variación de la Temperatura con Respecto a la Altura (Junio)')
plt.xlim([-60,20])
plt.xlabel('Temperatura (°C)')
plt.ylabel('Altura (m)')
plt.grid(True)
plt.show()
```

```
<matplotlib.figure.Figure at 0x1e9936d5c50>
```

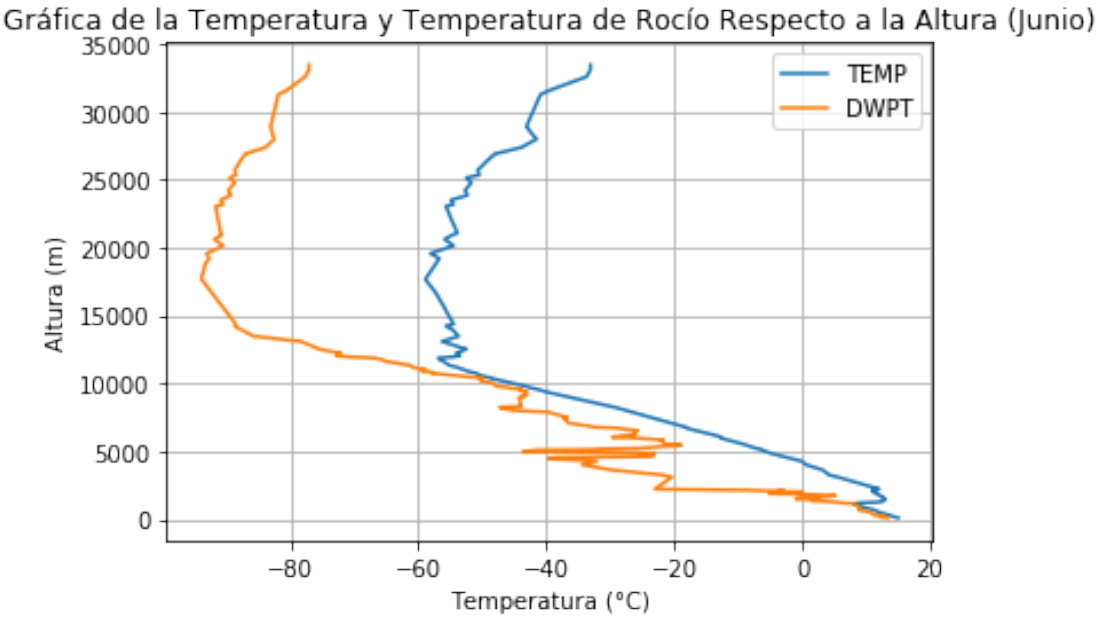


In [11]:
```
# Graficamos la variación de la presión con respecto a la altura (Diciembre)
df02 = df2[['HGHT','TEMP']]
plt.figure(); df02.plot(x='TEMP');plt.legend(loc='best')
plt.title('Variación de la Temperatura con Respecto a la Altura (Diciembre)')
plt.xlim([-80,15])
plt.xlabel('Temperatura (°C)')
plt.ylabel('Altura (m)')
plt.grid(True)
plt.show()
```

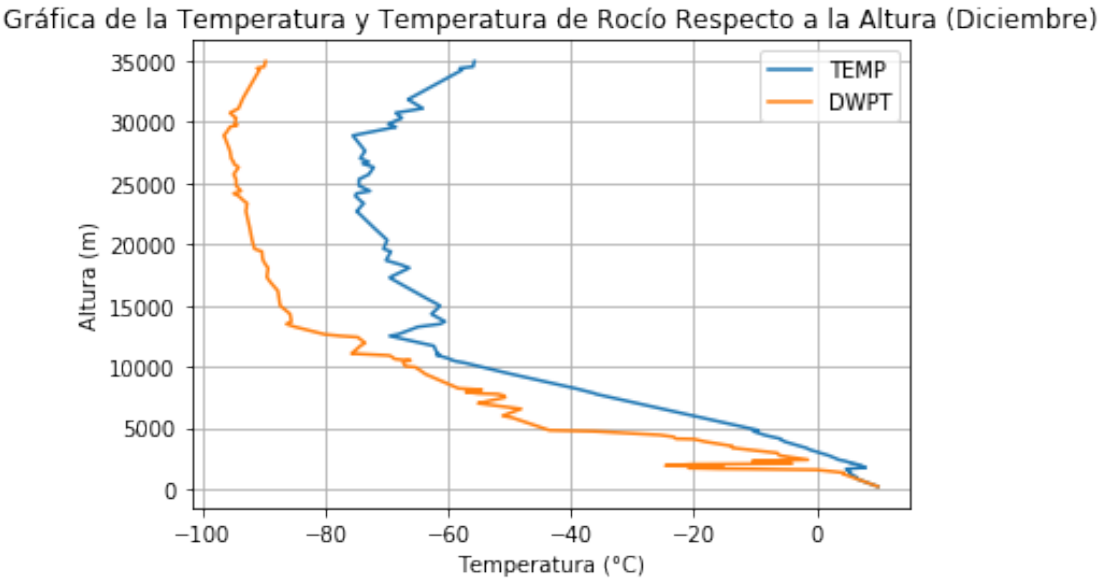
```
<matplotlib.figure.Figure at 0x1e9938c5438>
```



In [12]:
```
# Gráfica de la temperatura (TEMP) y temperatura de rocío (DWPT), como función de la al
x1=df1['TEMP']
x2=df1['DWPT']
y=df1['HGHT']
plt.plot(x1, y, label='TEMP')
plt.plot(x2, y, label='DWPT')
plt.legend(loc='best')
plt.title("Gráfica de la Temperatura y Temperatura de Rocío Respecto a la Altura (Junio
plt.xlabel("Temperatura (°C)")
plt.ylabel("Altura (m)")
plt.grid(True)
plt.show()
```

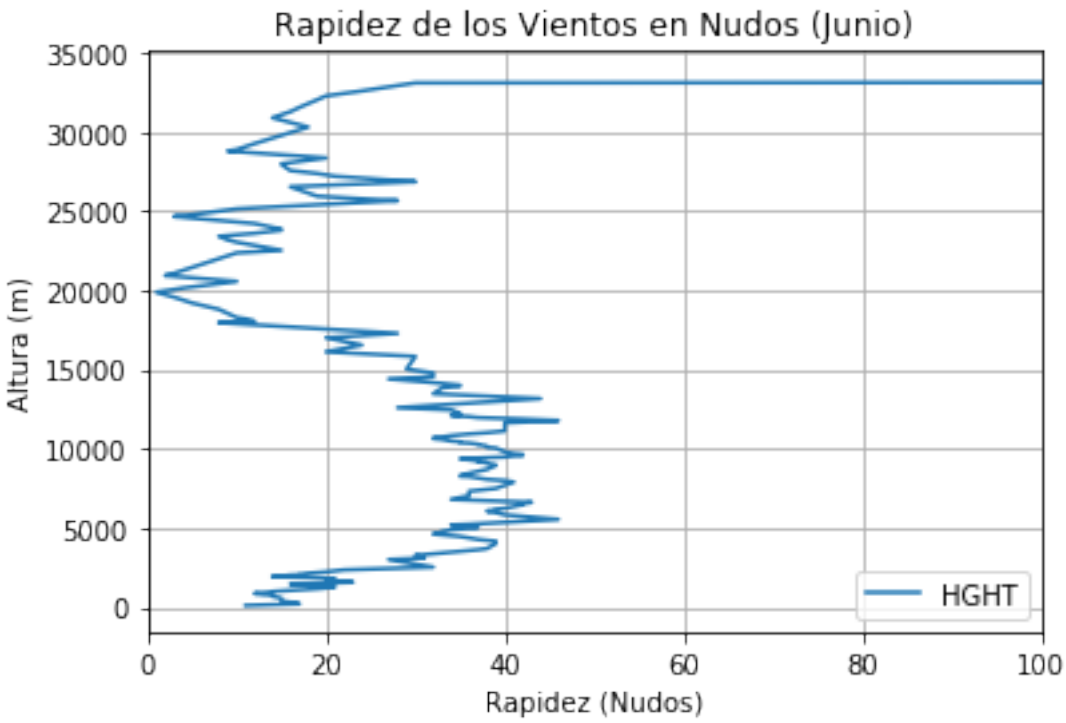


In [13]:
```
# Gráfica de la temperatura (TEMP) y temperatura de rocío (DWPT), como función de la al
x1=df2['TEMP']
x2=df2['DWPT']
y=df2['HGHT']
plt.plot(x1, y, label='TEMP')
plt.plot(x2, y, label='DWPT')
plt.legend(loc='best')
plt.title("Gráfica de la Temperatura y Temperatura de Rocío Respecto a la Altura (Dicie
plt.xlabel("Temperatura (°C)")
plt.ylabel("Altura (m)")
plt.grid(True)
plt.show()
```



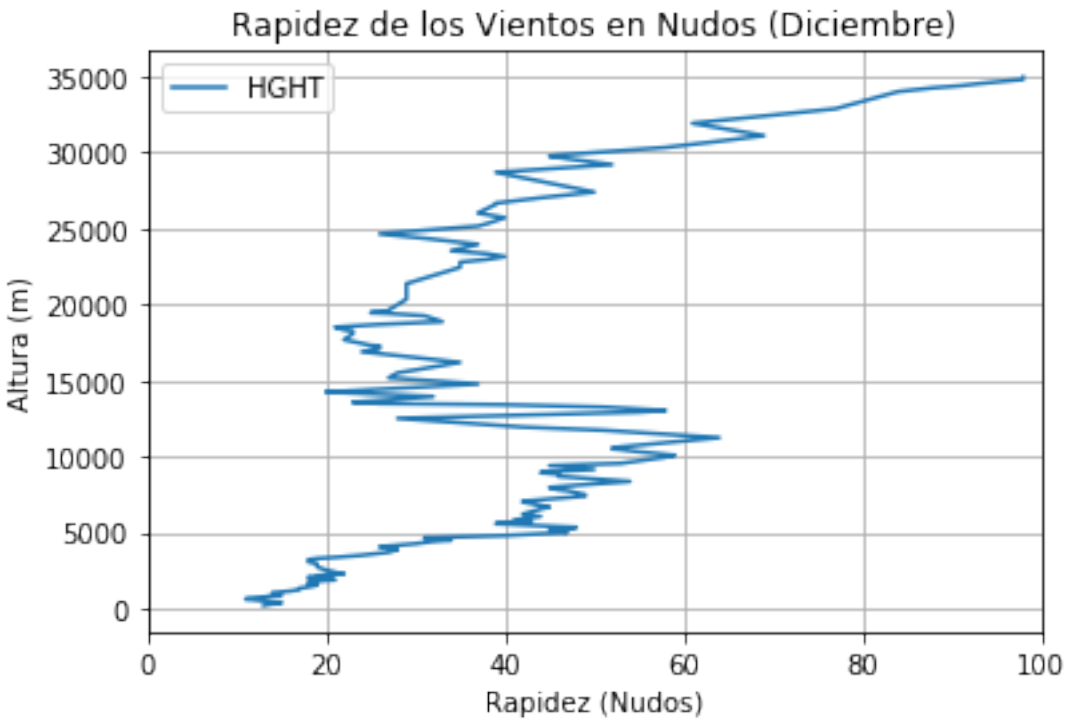
In [14]:
```
# Gráfica de la rapidez de los vientos en nudos (SKNT) (Junio)
df01 = df1[['SKNT','HGHT']]
plt.figure(); df01.plot(x='SKNT'); plt.legend(loc='best')
plt.title("Rapidez de los Vientos en Nudos (Junio)")
plt.xlabel("Rapidez (Nudos)")
plt.ylabel('Altura (m)')
plt.xlim([0,100])
plt.grid(True)
plt.show()
```

```
<matplotlib.figure.Figure at 0x1e993706d30>
```



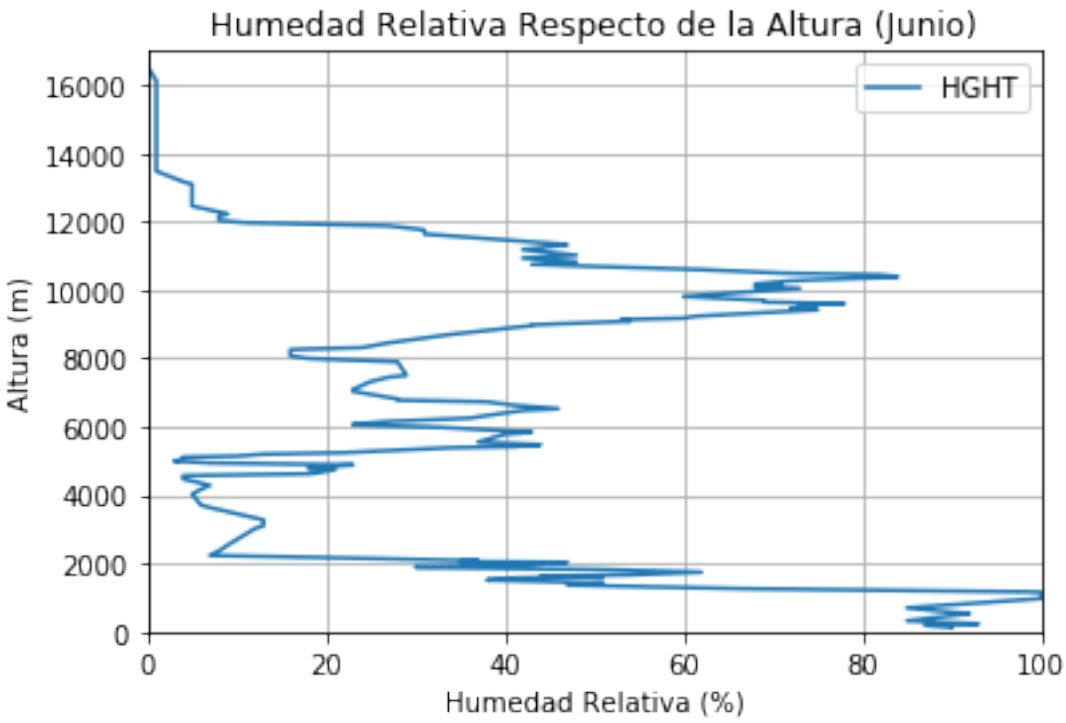

```
In [15]: # Gráfica de la rapidez de los vientos en nudos (SKNT) (Diciembre)
         df02 = df2[['SKNT','HGHT']]
         plt.figure(); df02.plot(x='SKNT'); plt.legend(loc='best')
         plt.title("Rapidez de los Vientos en Nudos (Diciembre)")
         plt.xlabel("Rapidez (Nudos)")
         plt.ylabel('Altura (m)')
         plt.xlim([0,100])
         plt.grid(True)
         plt.show()
```

```
<matplotlib.figure.Figure at 0x1e994a88208>
```



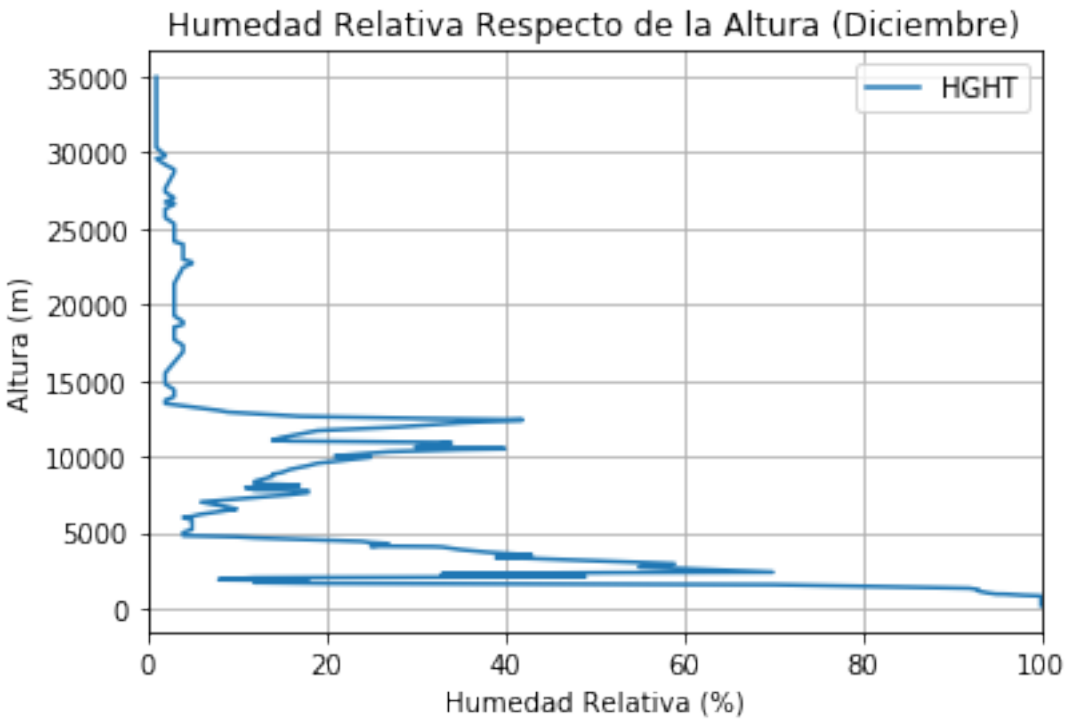
In [16]:
```
# Gráfica de la humedad relativa como función de la altura (Junio)
df01 = df1[['RELH','HGHT']]
plt.figure(); df01.plot(x='RELH');plt.legend(loc='best')
plt.title('Humedad Relativa Respecto de la Altura (Junio)')
plt.xlabel('Humedad Relativa (%)')
plt.ylabel('Altura (m)')
plt.xlim([0,100])
plt.ylim([0,17000])
plt.grid(True)
plt.show()
```

```
<matplotlib.figure.Figure at 0x1e9938b3ef0>
```



In [17]:
```
# Gráfica de la humedad relativa como función de la altura (Diciembre)
df02 = df2[['RELH','HGHT']]
plt.figure(); df02.plot(x='RELH');plt.legend(loc='best')
plt.title('Humedad Relativa Respecto de la Altura (Diciembre)')
plt.xlabel('Humedad Relativa (%)')
plt.ylabel('Altura (m)')
plt.xlim([0,100])
plt.grid(True)
plt.show()
```

```
<matplotlib.figure.Figure at 0x1e994a330f0>
```


Humedad Relativa Respecto de la Altura (Diciembre)
HGHT
Altura (m)
35000
30000
25000
20000
15000
10000
5000
0
0
20
40
60
80
100
Humedad Relativa (%)