leafdown:
Interactive Multi-Layer Maps in Shiny Apps

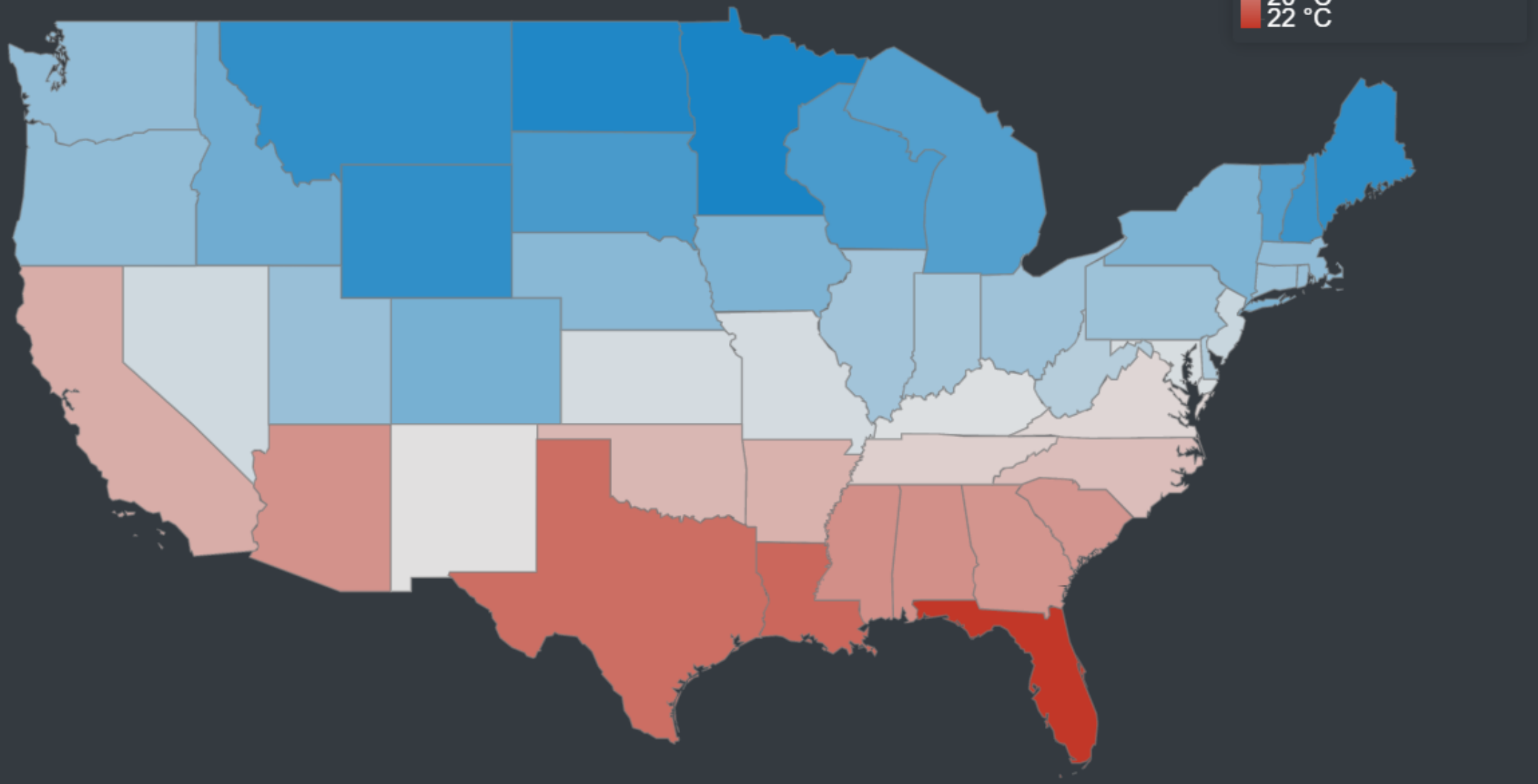
Andreas Hofheinz - R Studio Conference 2022

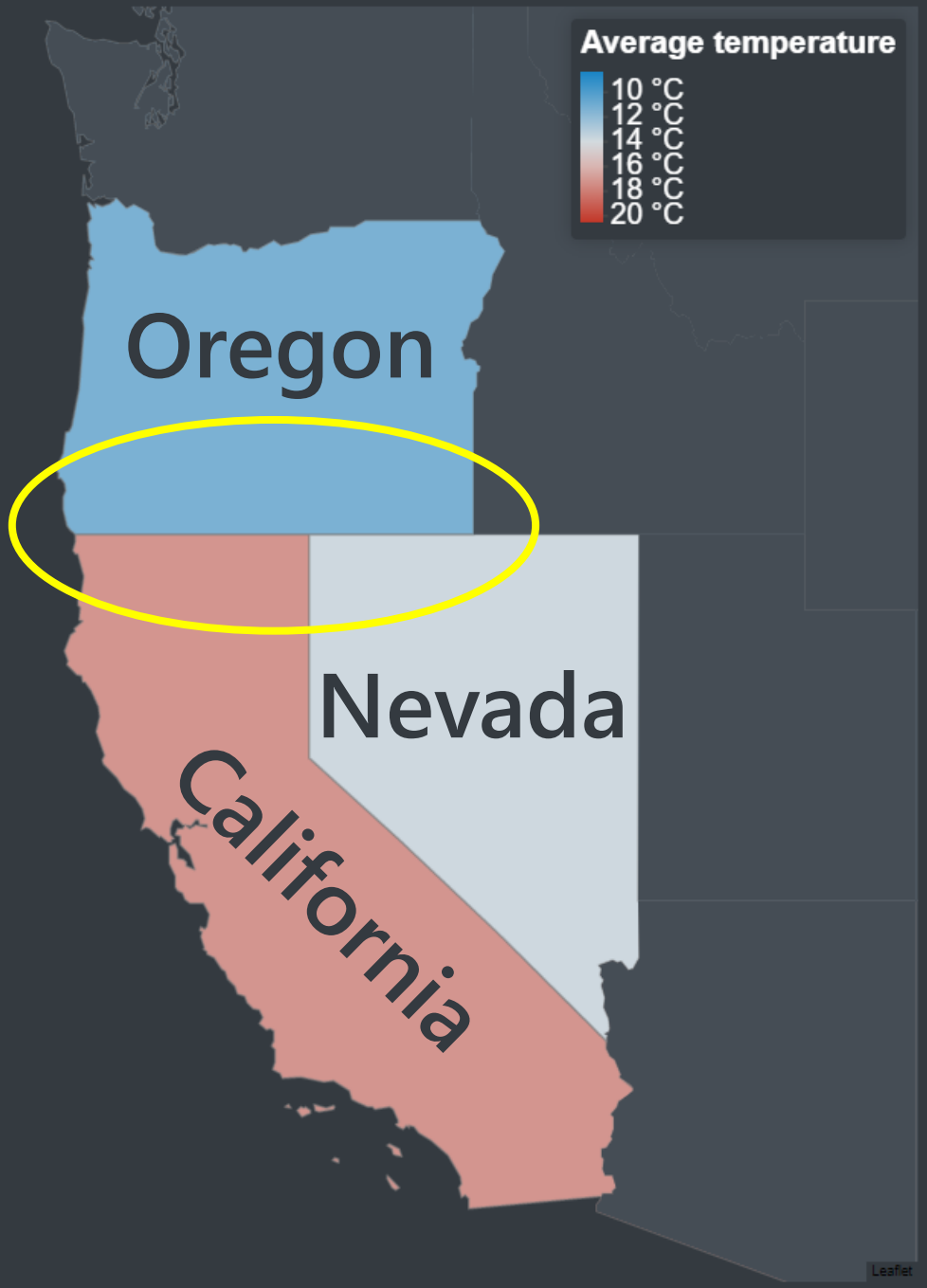
Meteostat Weather's Record Keeper[1]:

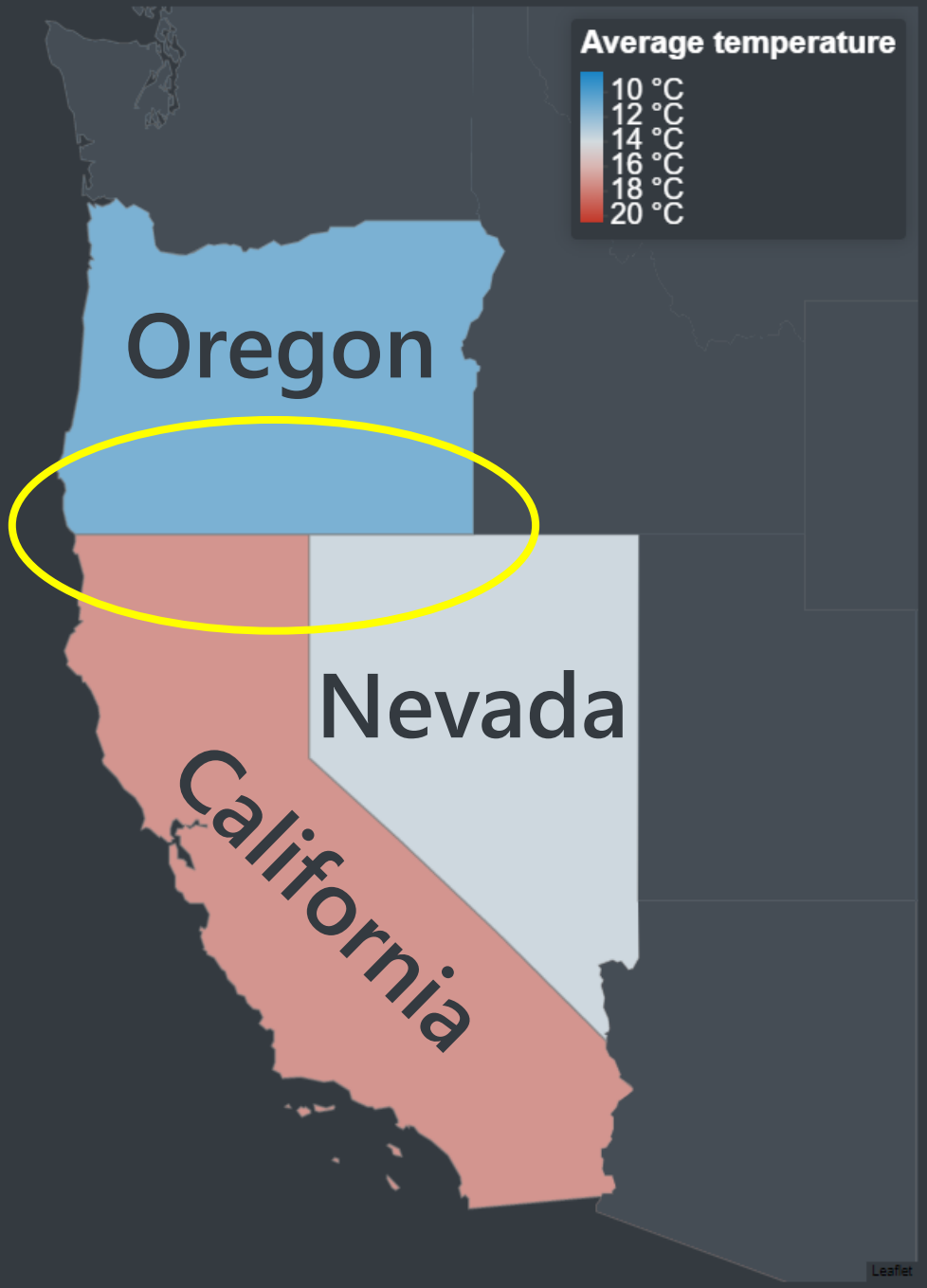
- Monthly measurements from 2,335 weather stations in the US (e.g., average temperature and precipitation)

→ How can we most effectively explore this data?

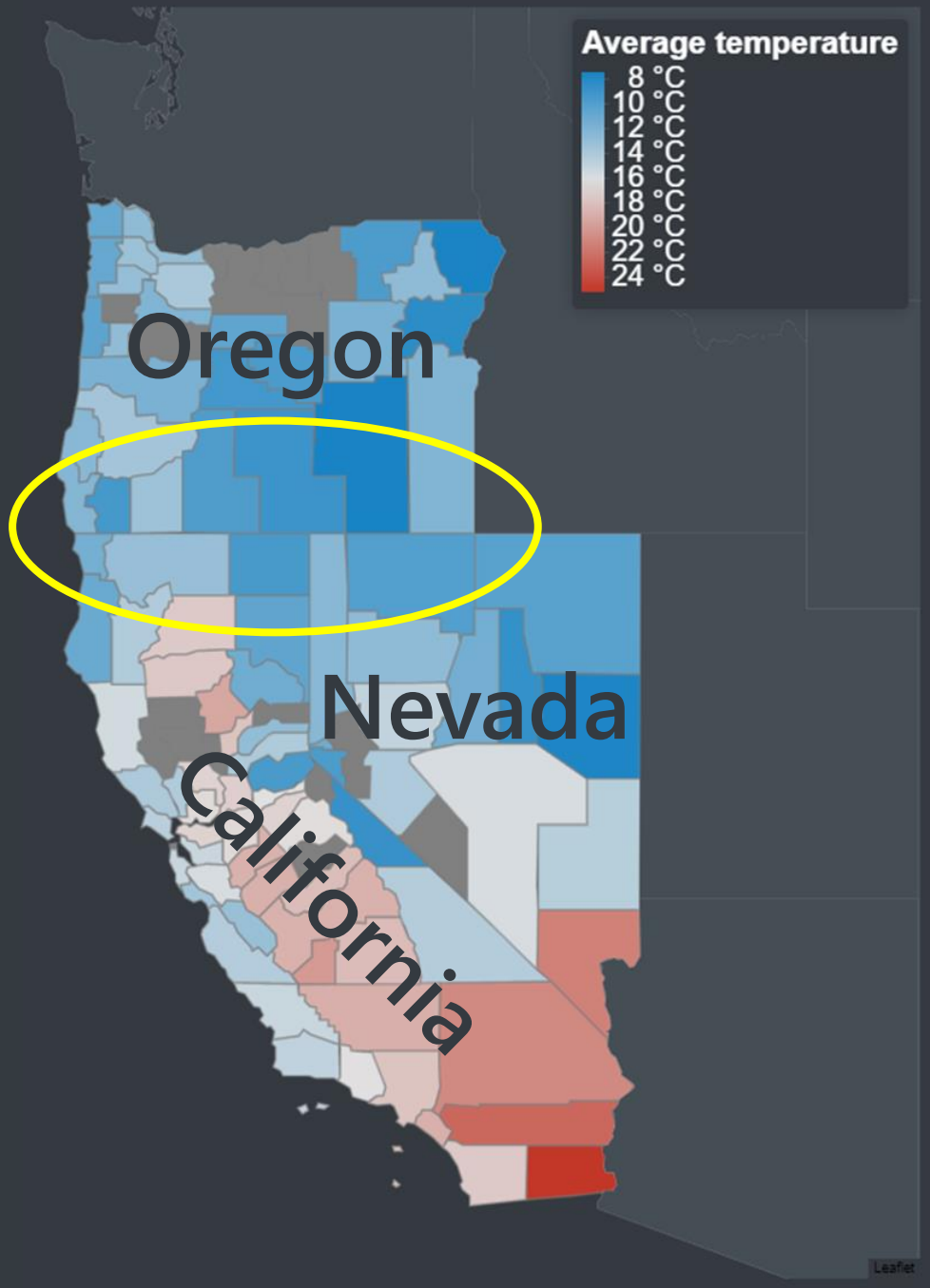
[1] https://dev.meteostat.net/


Average temperature
8 °C
10 °C
12 °C
14 °C
16 °C
18 °C
20 °C
22 °C

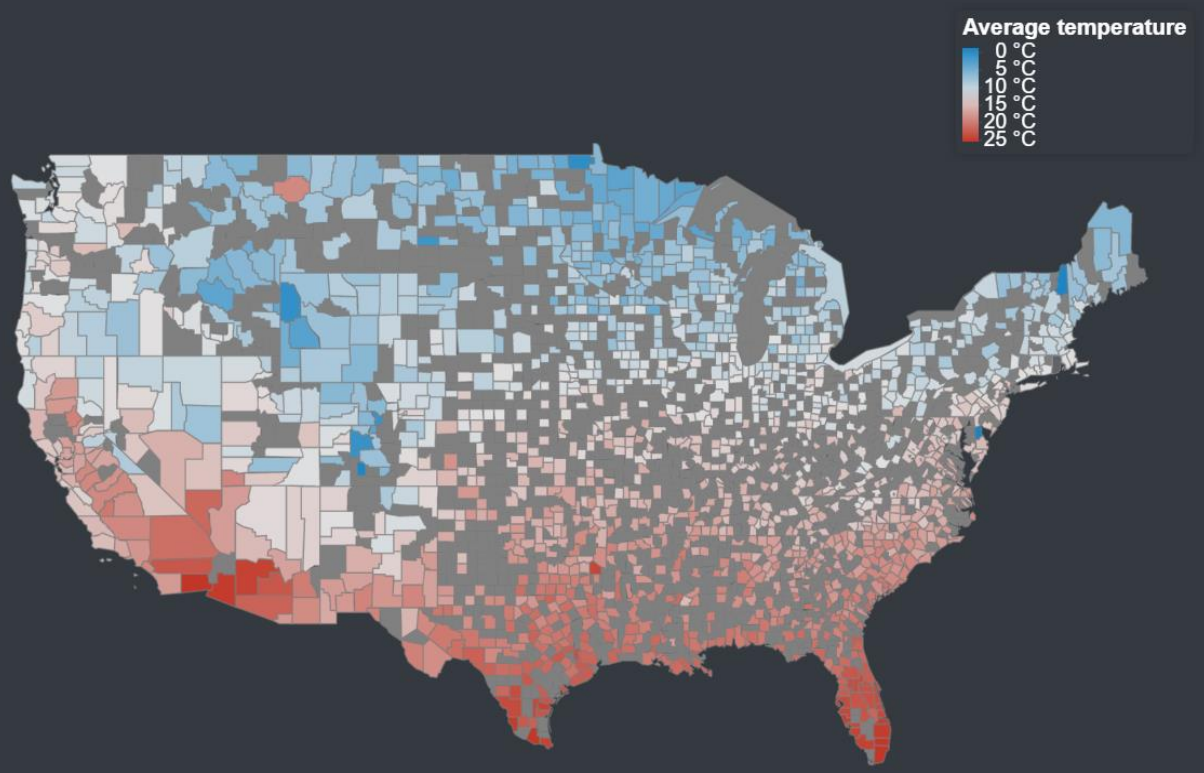

Average temperature
10 °C
12 °C
14 °C
16 °C
18 °C
20 °C
Oregon
Nevada
California
Leaflet

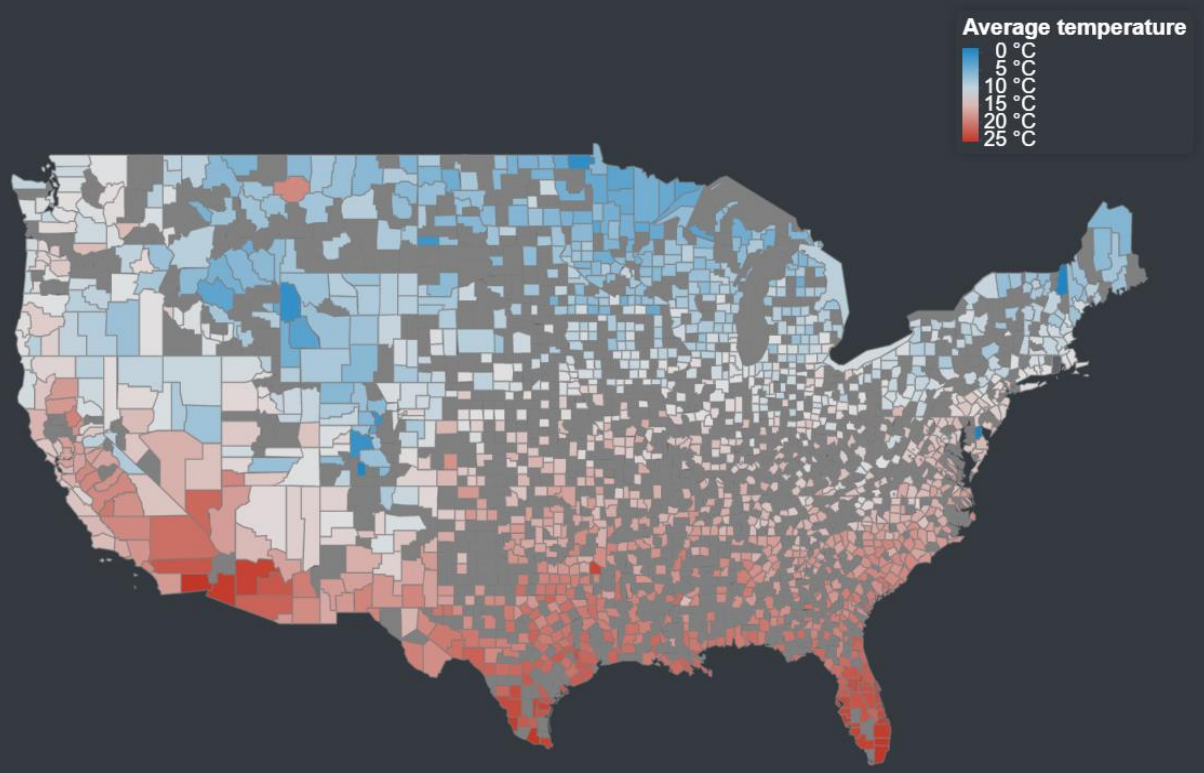


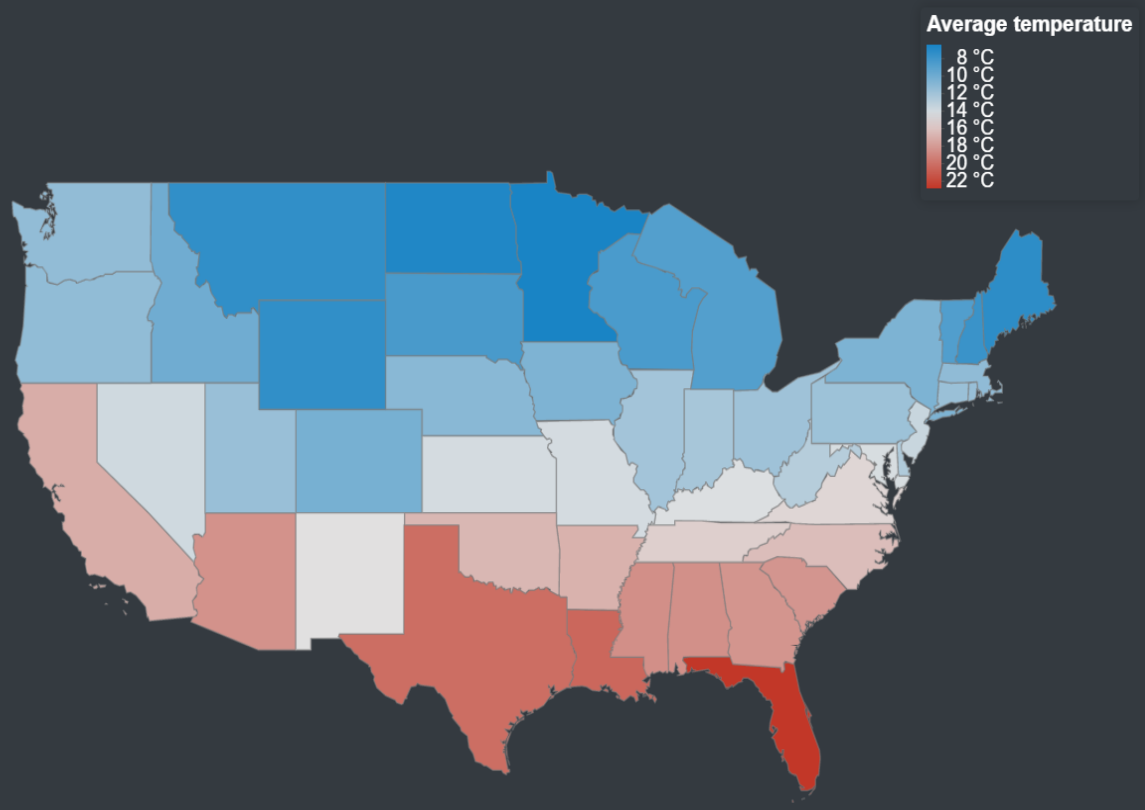
→ How can we “zoom in”?

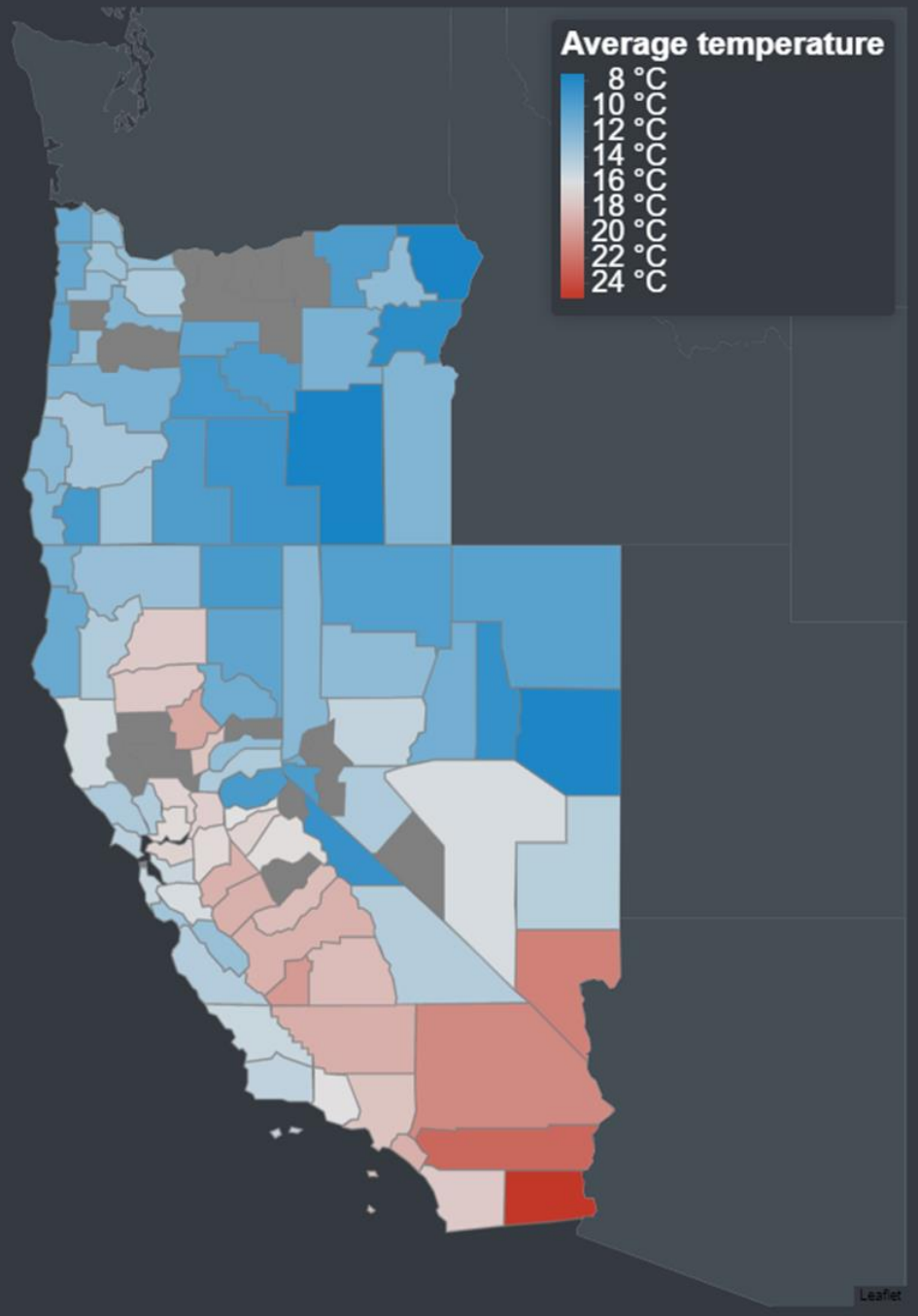

Average temperature
8 °C
10 °C
12 °C
14 °C
16 °C
18 °C
20 °C
22 °C
24 °C
Oregon
Nevada
California
Leaflet

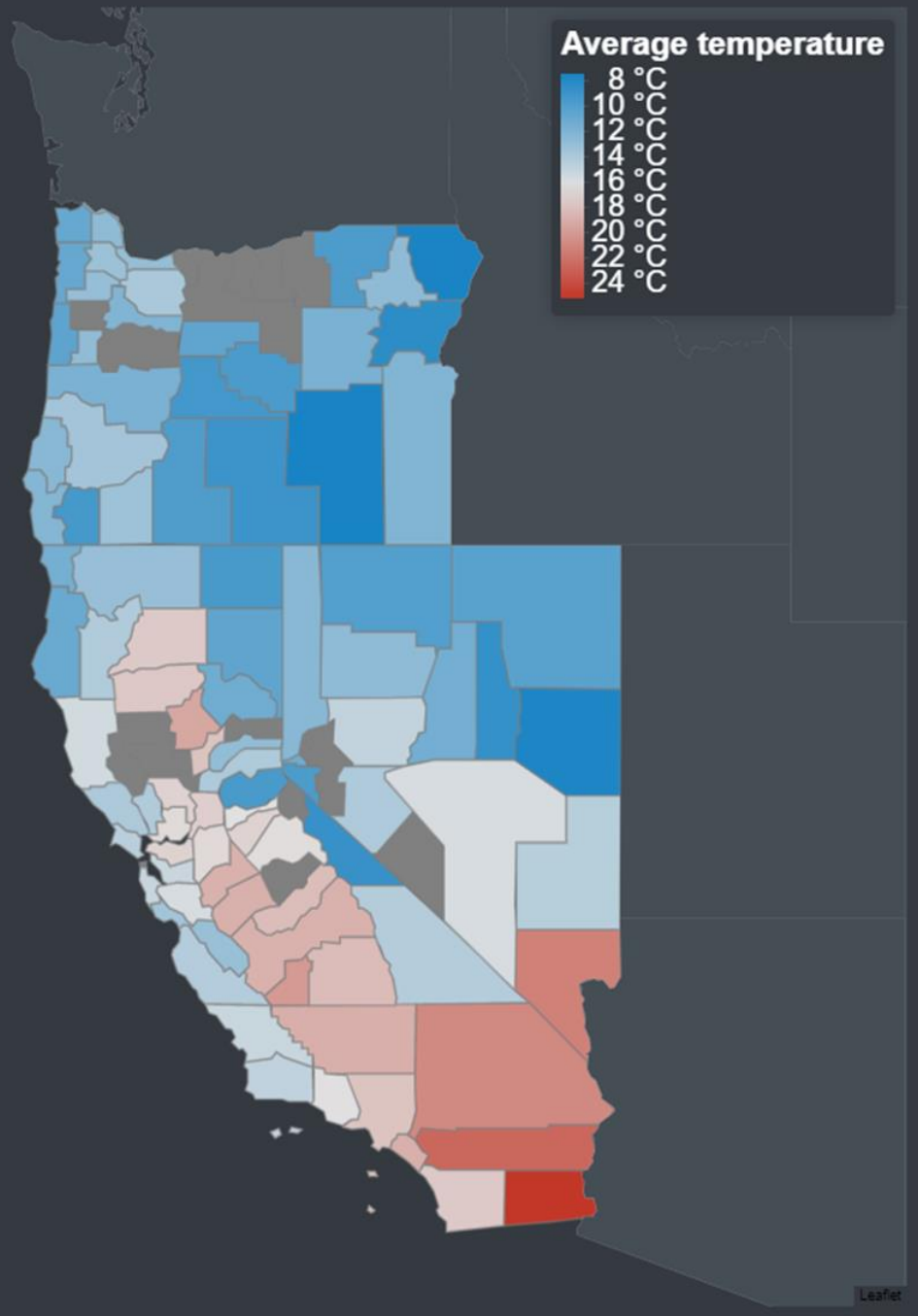
→ Drill down!


Average temperature
0 °C
5 °C
10 °C
15 °C
20 °C
25 °C

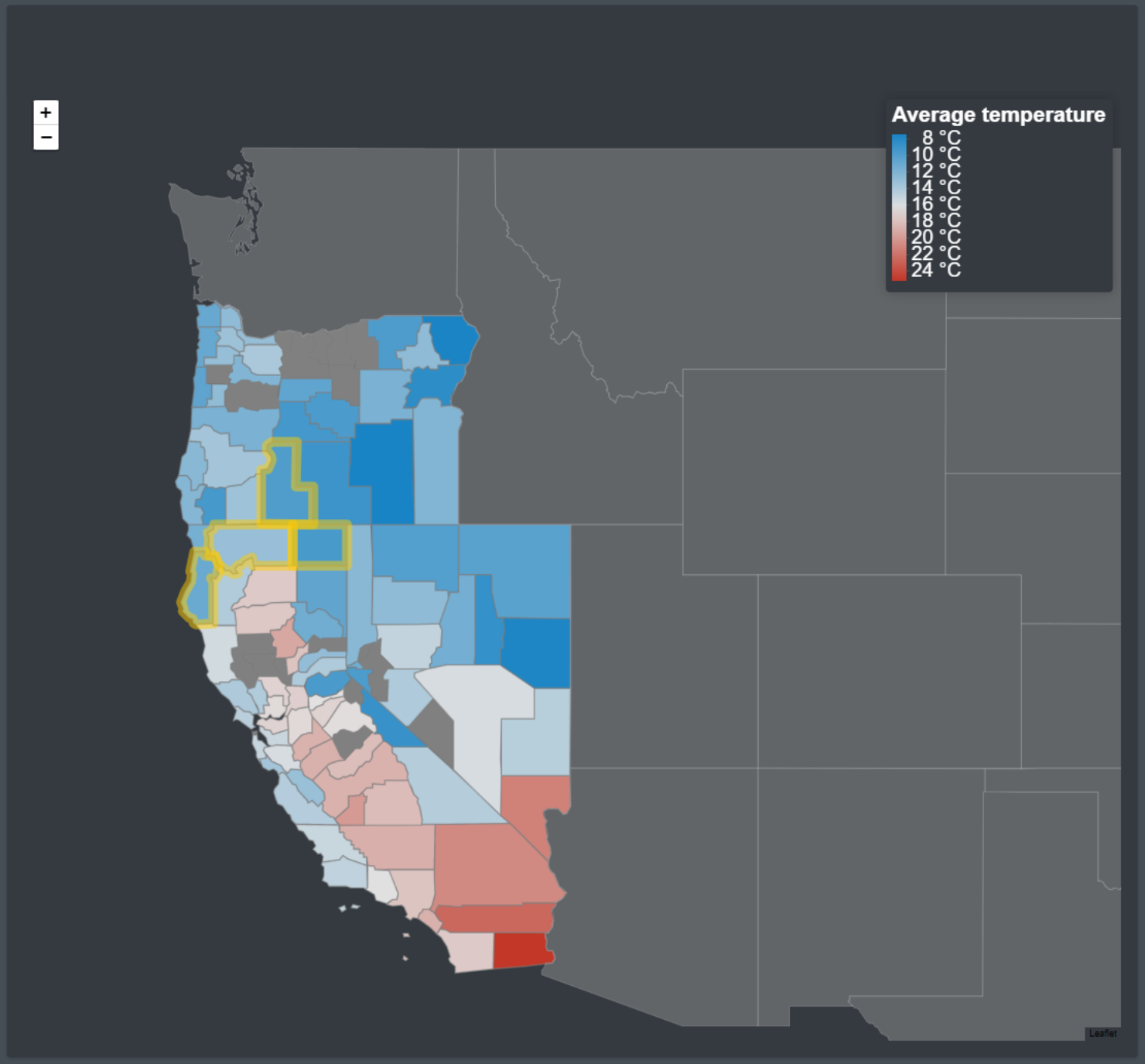

Average temperature
0 °C
5 °C
10 °C
15 °C
20 °C
25 °C


Average temperature
8 °C
10 °C
12 °C
14 °C
16 °C
18 °C
20 °C
22 °C

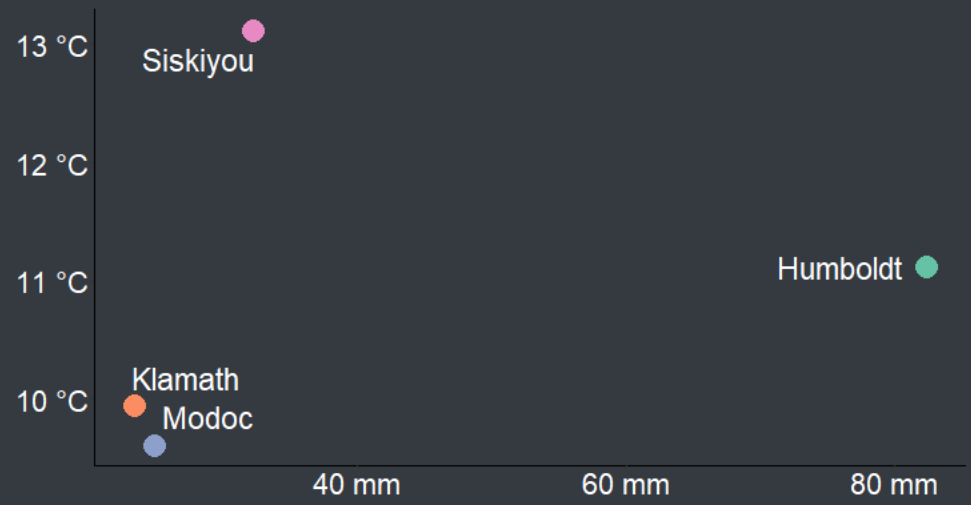

Average temperature
8 °C
10 °C
12 °C
14 °C
16 °C
18 °C
20 °C
22 °C
24 °C
Leaflet



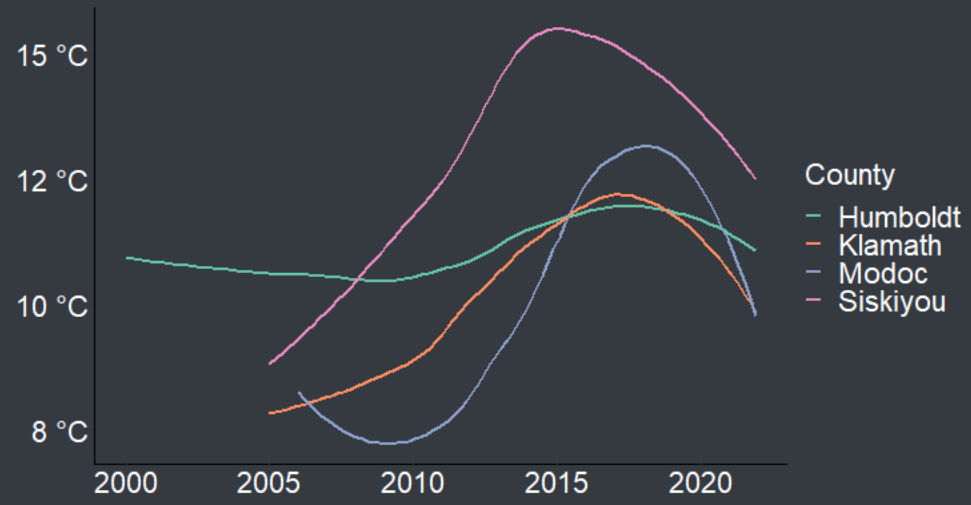
→ How can we visualize multiple variables simultaneously?



Average temperature [°C] and monthly precipitation [mm]

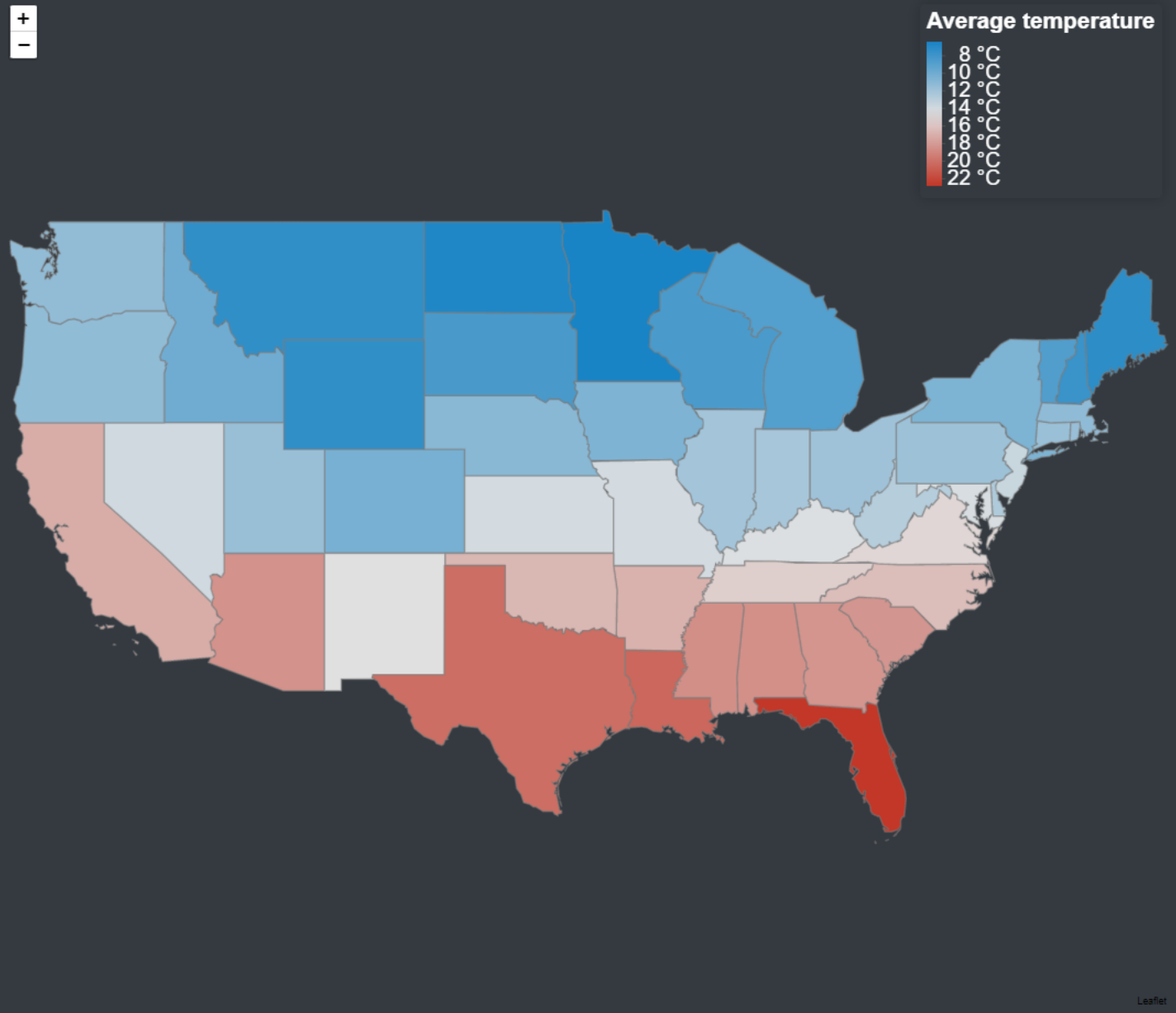


Development of the average temperature [°C]



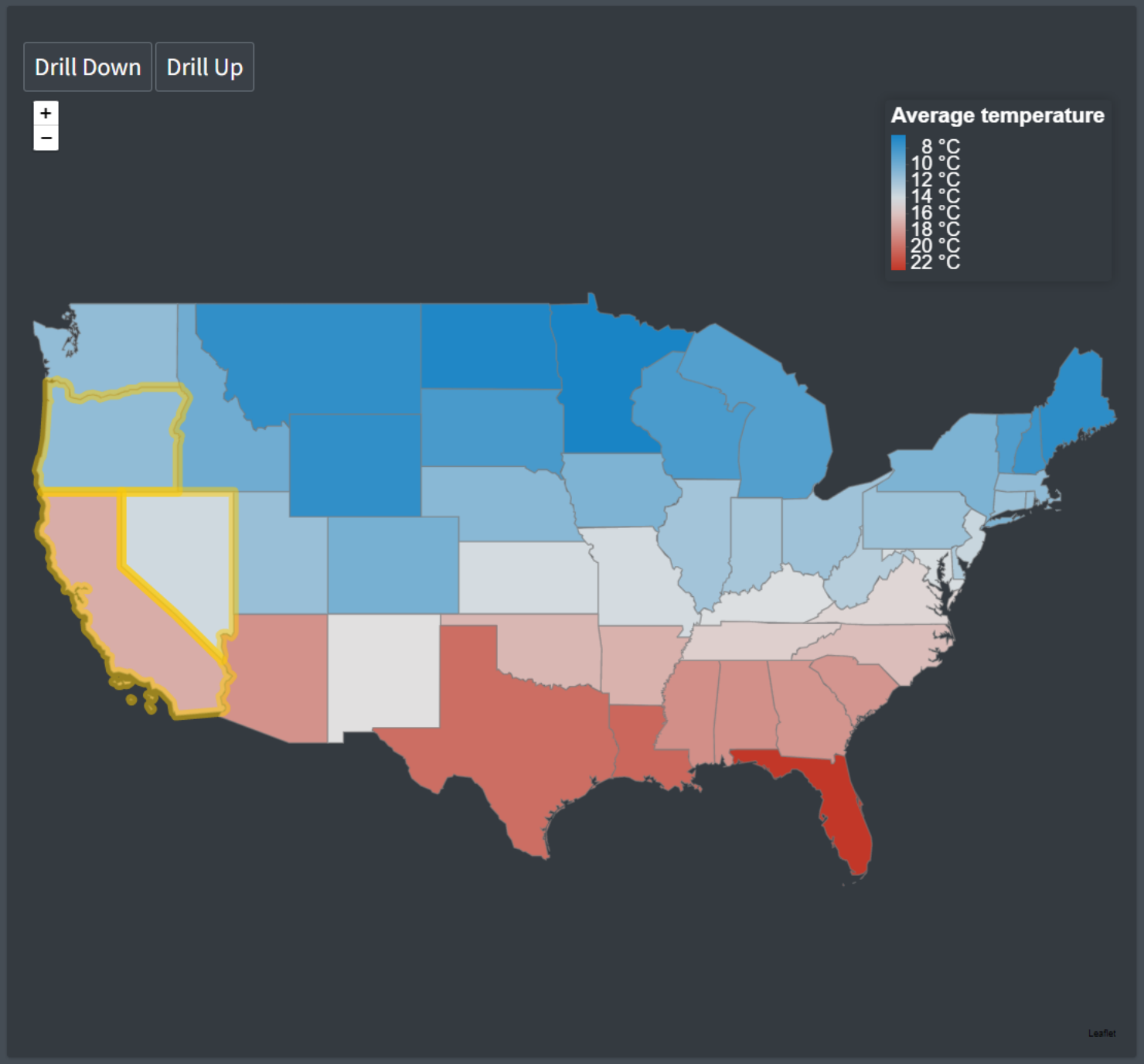
Packaging these ideas...

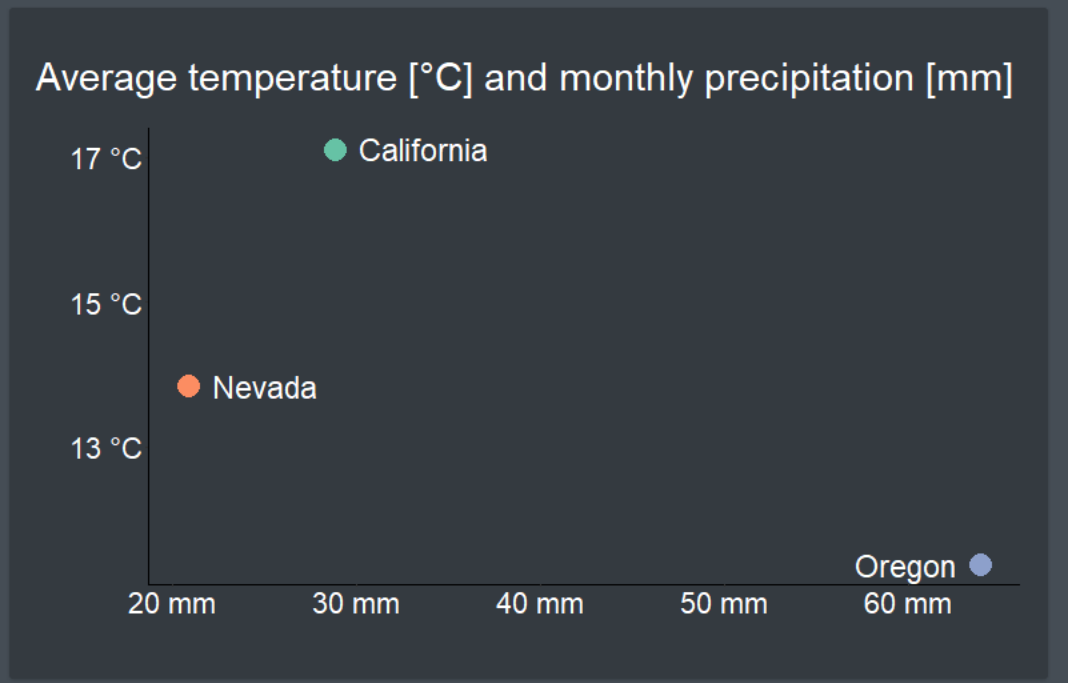
Drill Down | Drill Up

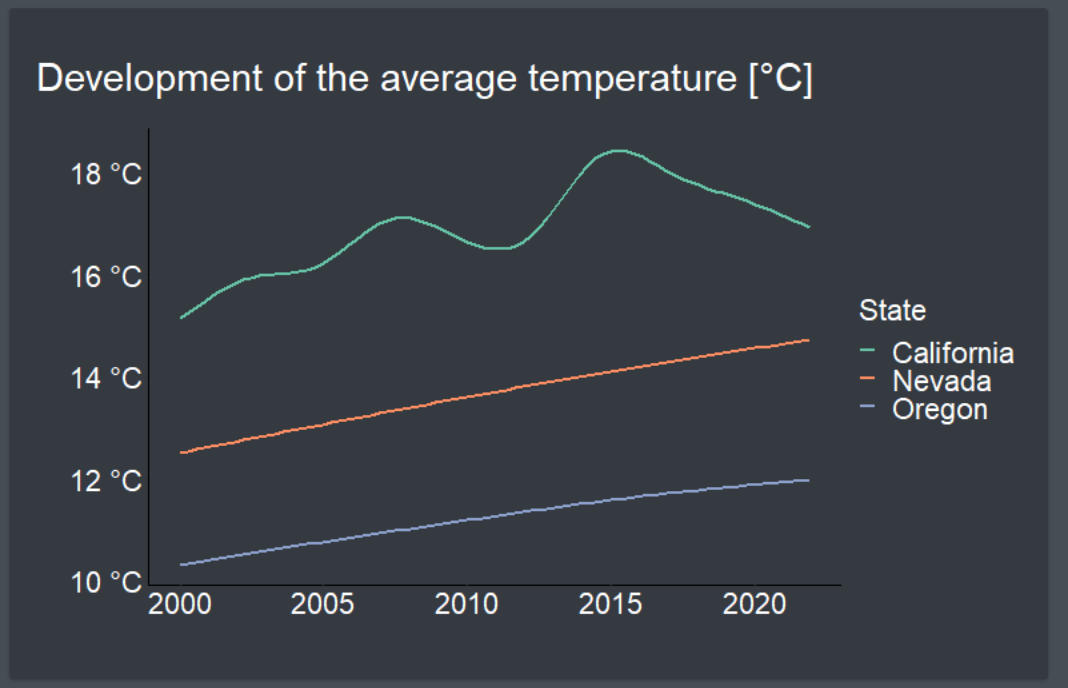


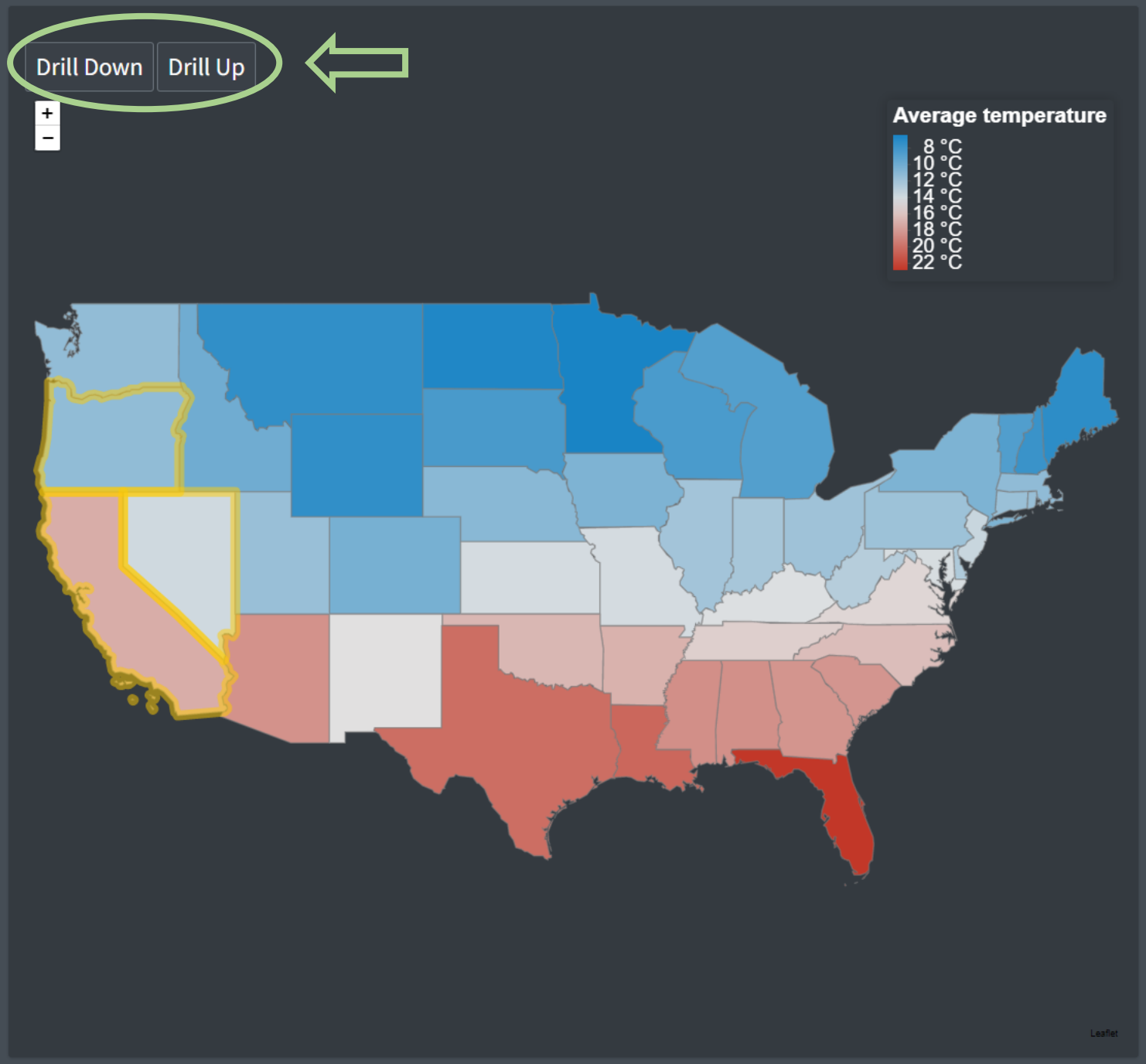
Average temperature [°C] and monthly precipitation [mm]

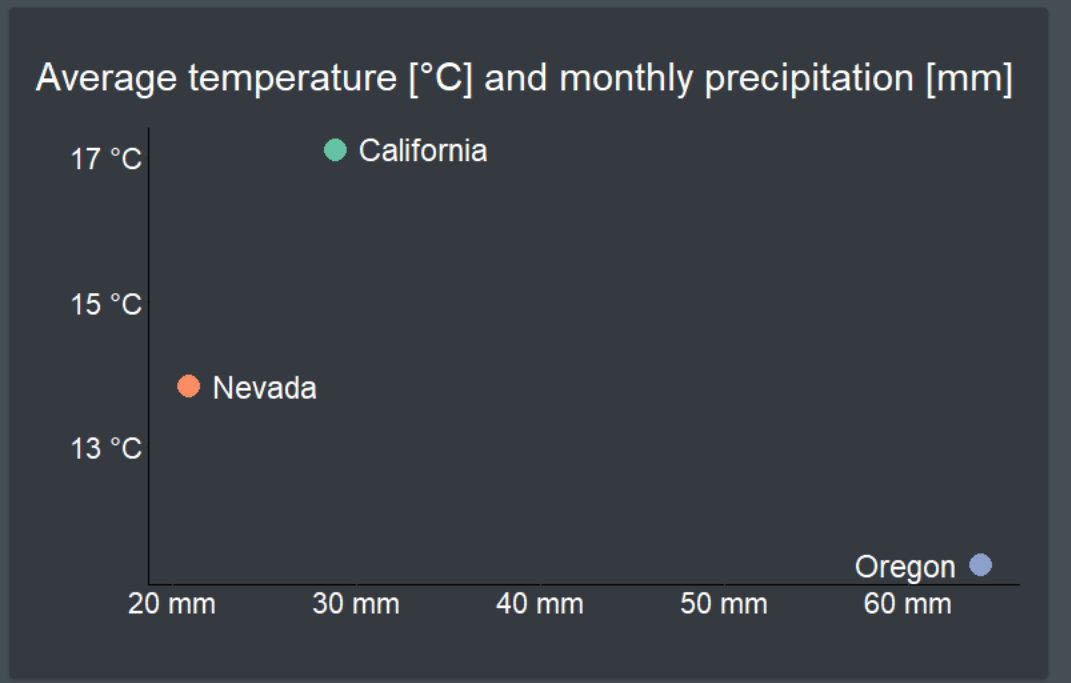
Development of the average temperature [°C]

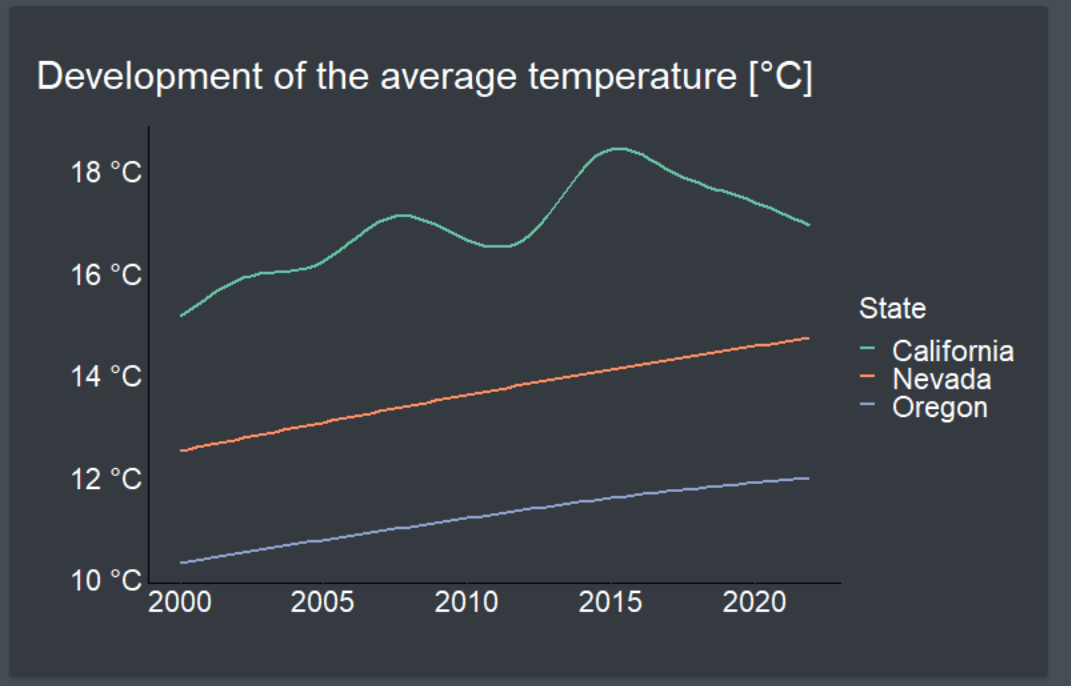

Drill Down
Drill Up
+
−
Average temperature
8 °C
10 °C
12 °C
14 °C
16 °C
18 °C
20 °C
22 °C
Leaflet


Average temperature [°C] and monthly precipitation [mm]
17 °C
15 °C
13 °C
California
Nevada
Oregon
20 mm
30 mm
40 mm
50 mm
60 mm

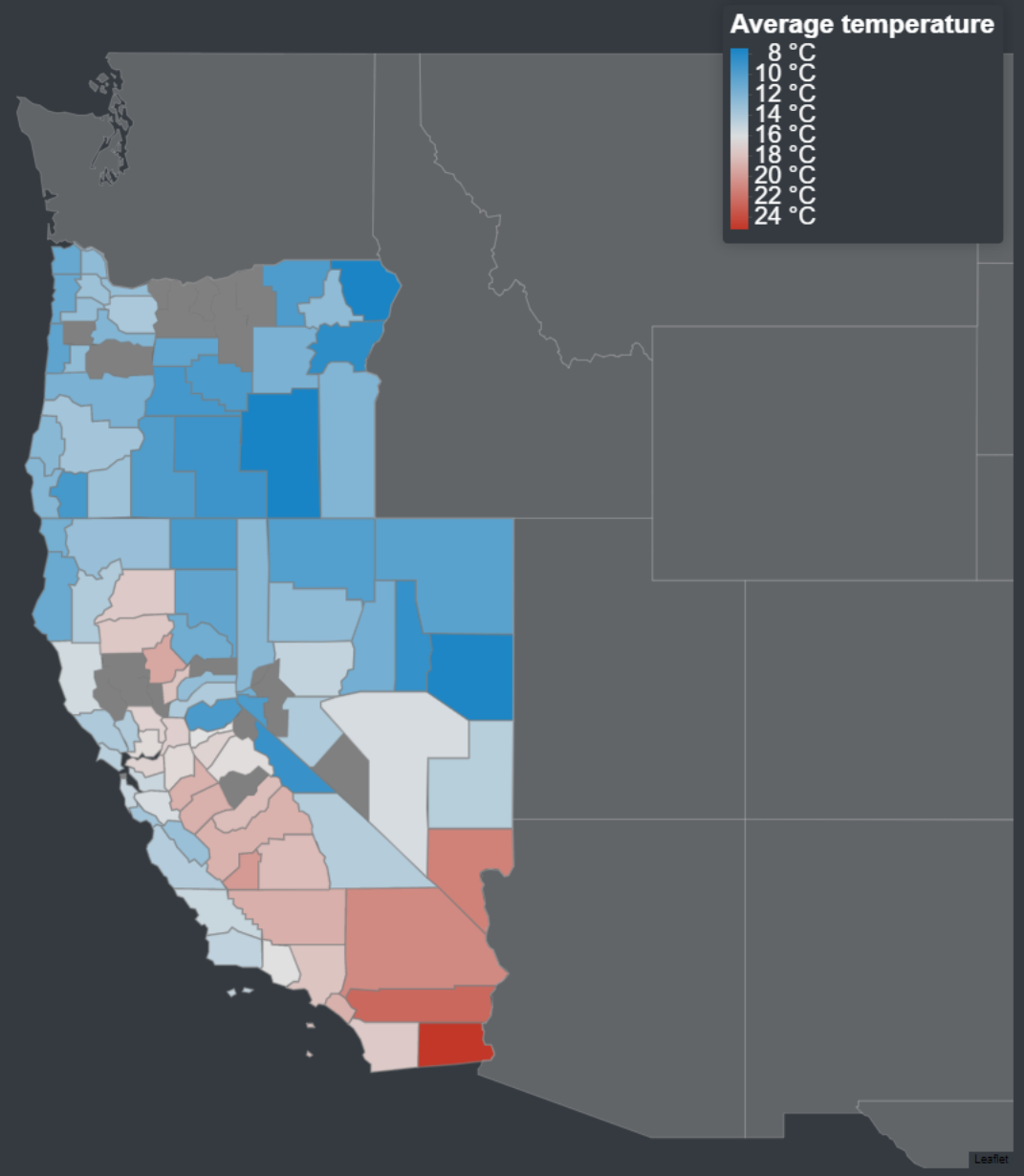

Development of the average temperature [°C]
18 °C
16 °C
14 °C
12 °C
10 °C
2000
2005
2010
2015
2020
State
California
Nevada
Oregon


Drill Down
Drill Up
+
−
Average temperature
8 °C
10 °C
12 °C
14 °C
16 °C
18 °C
20 °C
22 °C
Leaflet


Average temperature [°C] and monthly precipitation [mm]
17 °C
15 °C
13 °C
California
Nevada
Oregon
20 mm
30 mm
40 mm
50 mm
60 mm

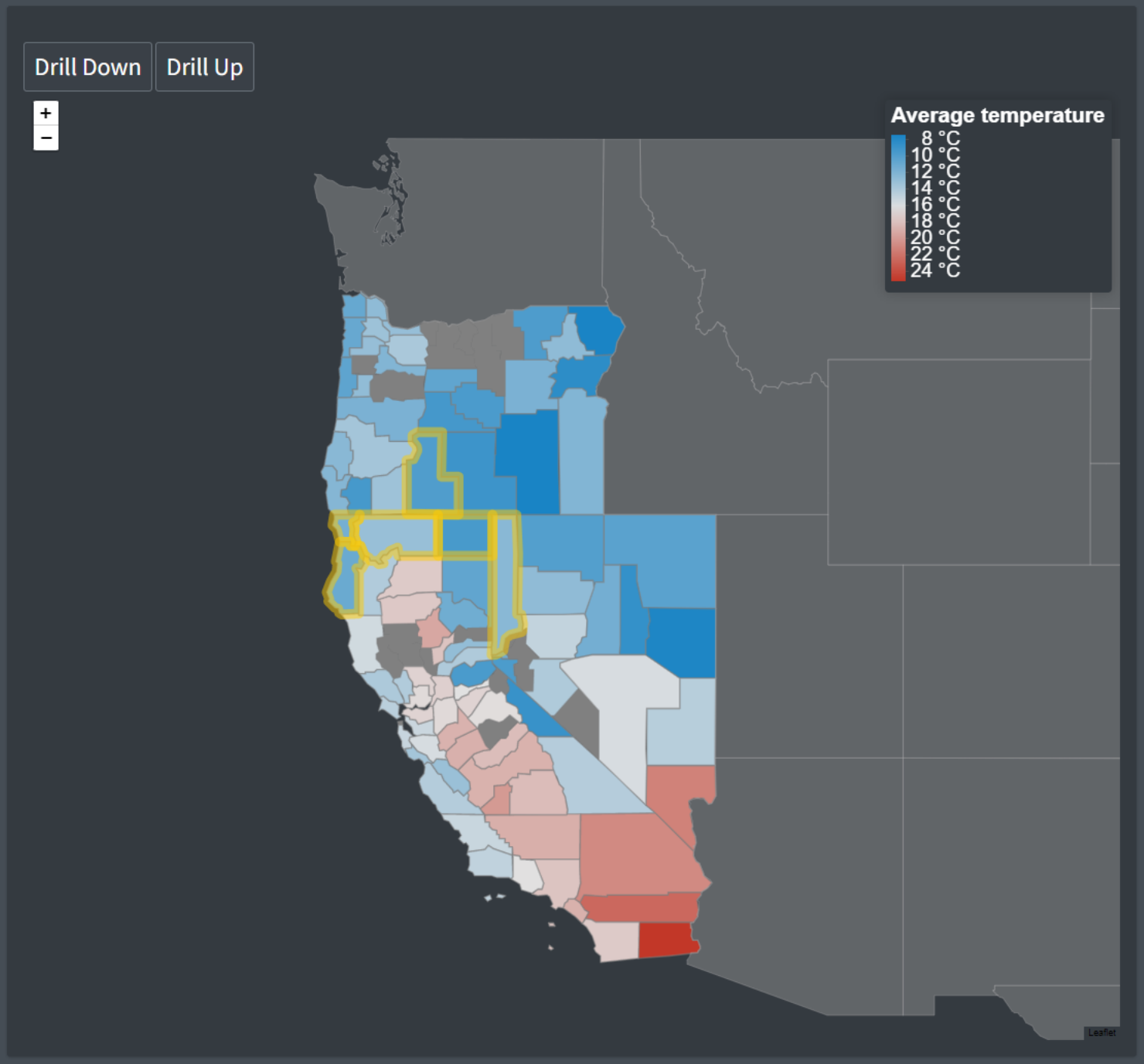

Development of the average temperature [°C]
18 °C
16 °C
14 °C
12 °C
10 °C
2000
2005
2010
2015
2020
State
California
Nevada
Oregon

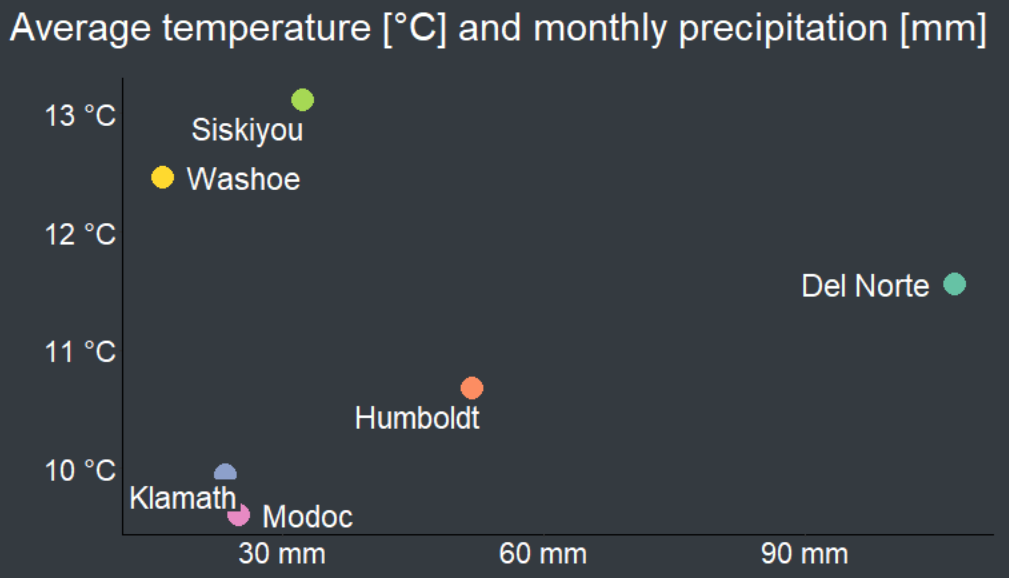
Drill Down | Drill Up

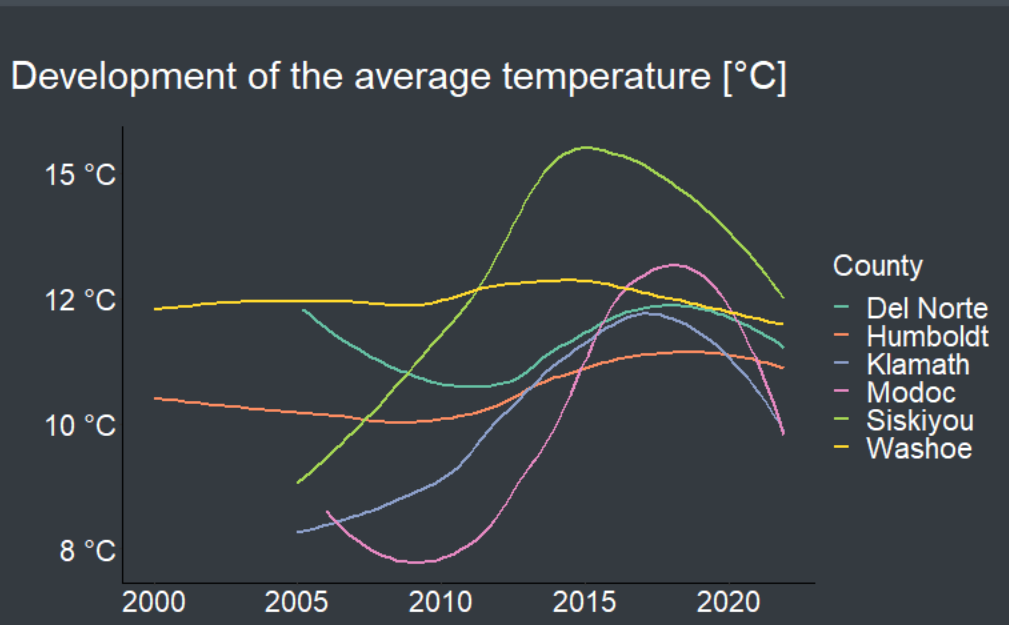


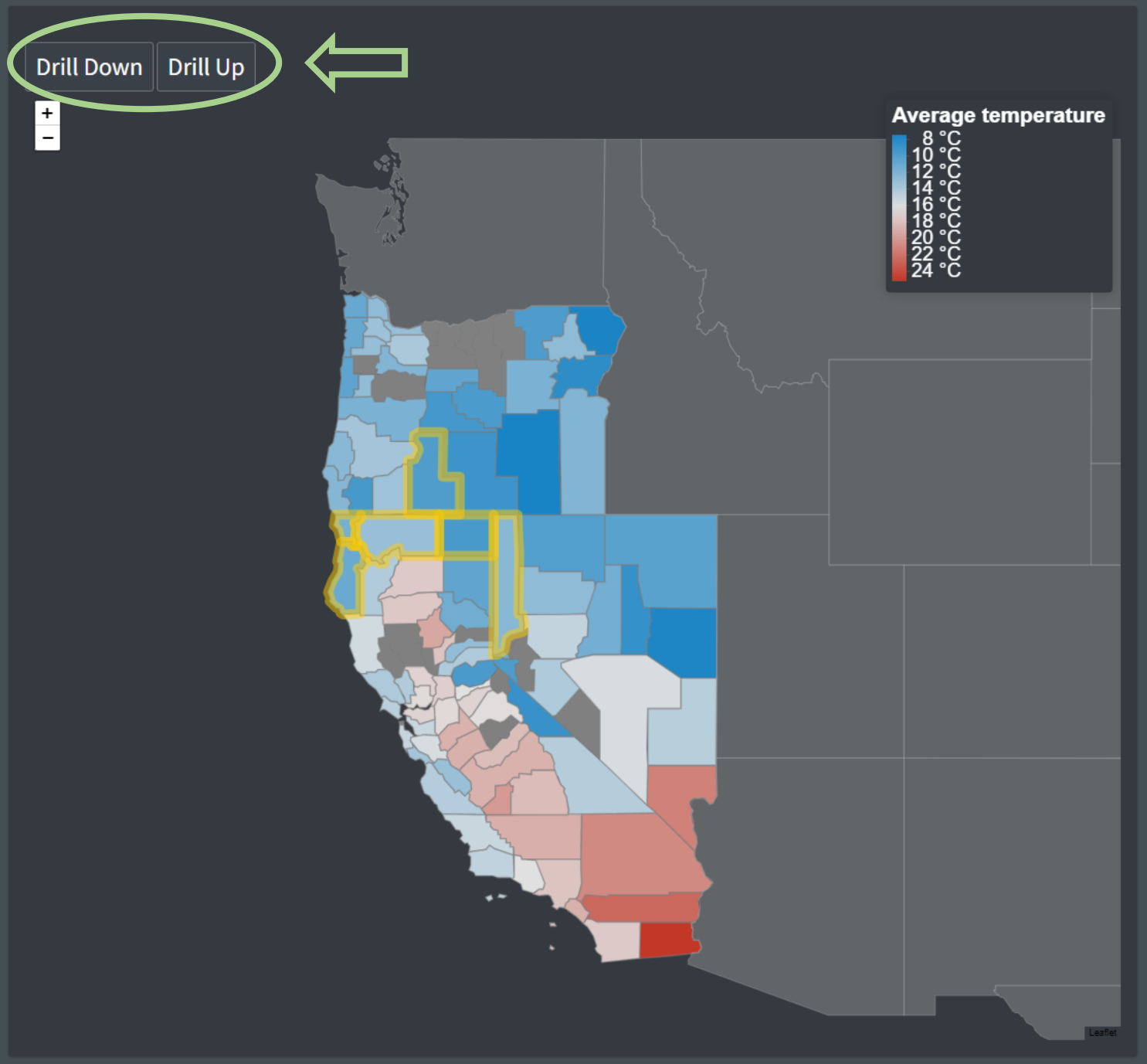
Average temperature [°C] and monthly precipitation [mm]

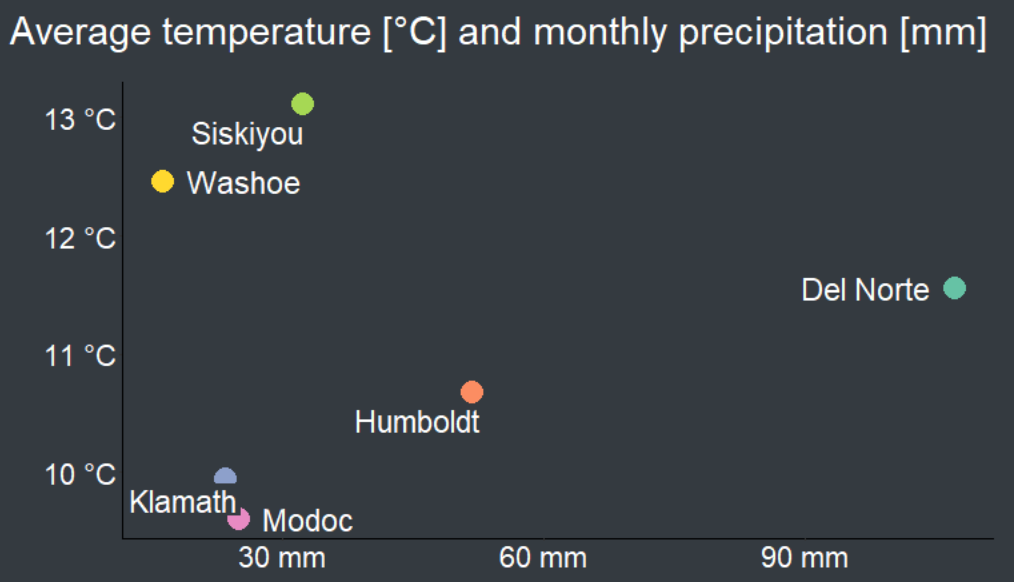
Development of the average temperature [°C]

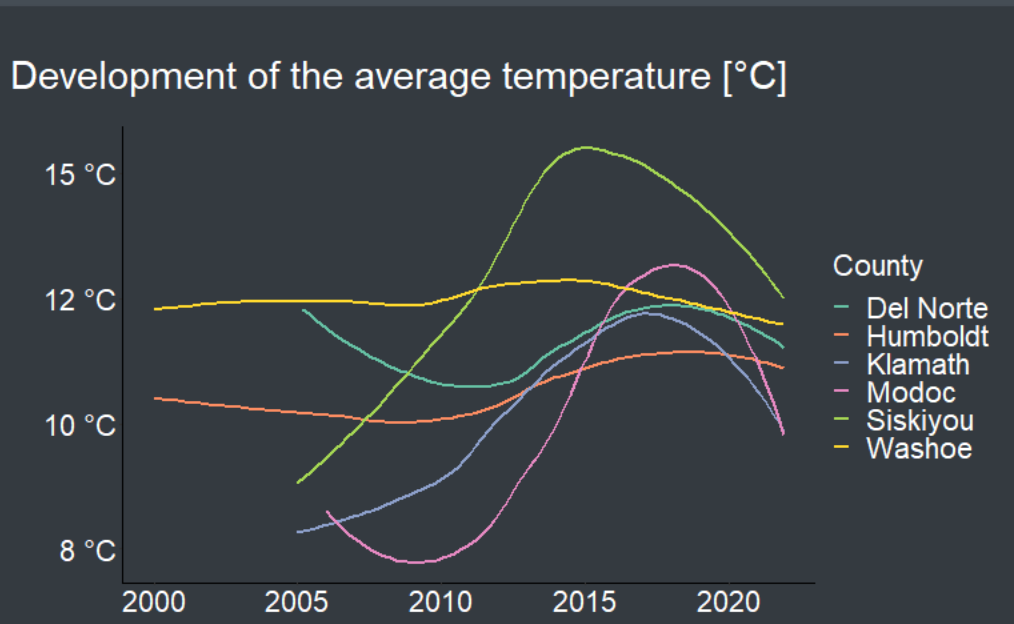

Drill Down
Drill Up
+
−
Average temperature
8 °C
10 °C
12 °C
14 °C
16 °C
18 °C
20 °C
22 °C
24 °C
Leaflet


Average temperature [°C] and monthly precipitation [mm]
13 °C
12 °C
11 °C
10 °C
Siskiyou
Washoe
Del Norte
Humboldt
Klamath
Modoc
30 mm
60 mm
90 mm

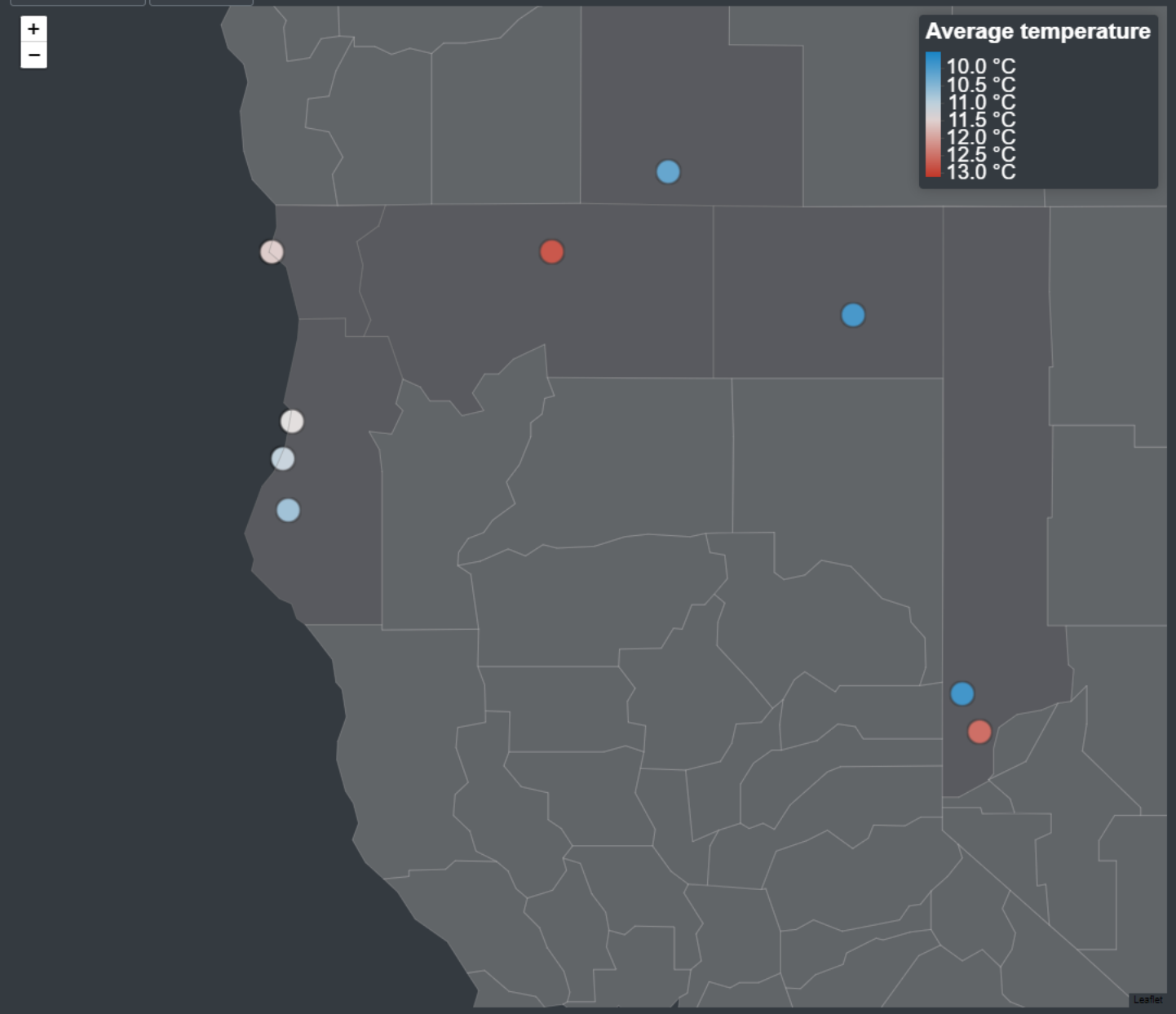

Development of the average temperature [°C]
15 °C
12 °C
10 °C
8 °C
2000
2005
2010
2015
2020
County
Del Norte
Humboldt
Klamath
Modoc
Siskiyou
Washoe


Drill Down
Drill Up
+
−
Average temperature
8 °C
10 °C
12 °C
14 °C
16 °C
18 °C
20 °C
22 °C
24 °C
Leaflet


Average temperature [°C] and monthly precipitation [mm]
13 °C
12 °C
11 °C
10 °C
Siskiyou
Washoe
Del Norte
Humboldt
Klamath
Modoc
30 mm
60 mm
90 mm

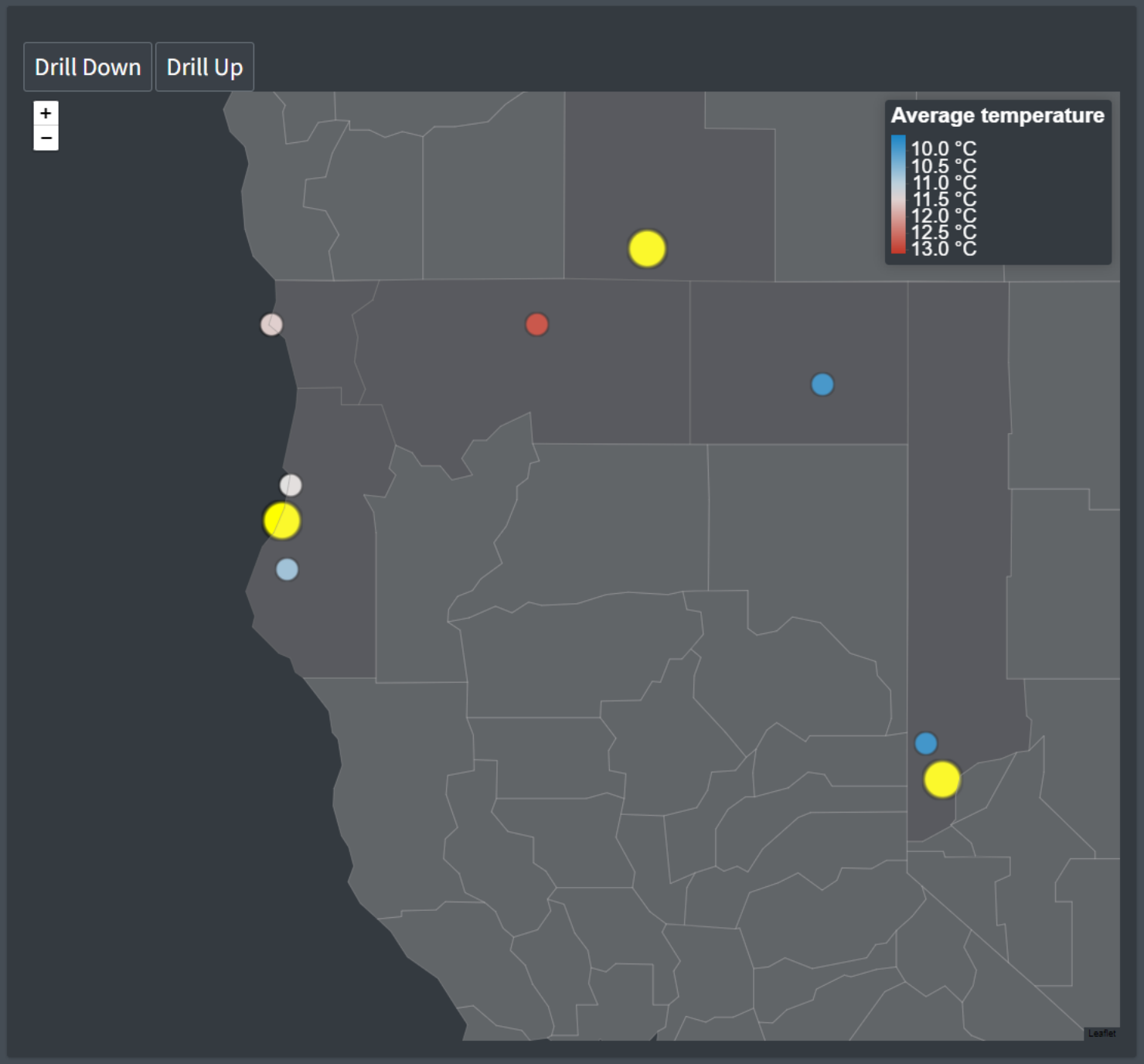

Development of the average temperature [°C]
15 °C
12 °C
10 °C
8 °C
2000
2005
2010
2015
2020
County
Del Norte
Humboldt
Klamath
Modoc
Siskiyou
Washoe

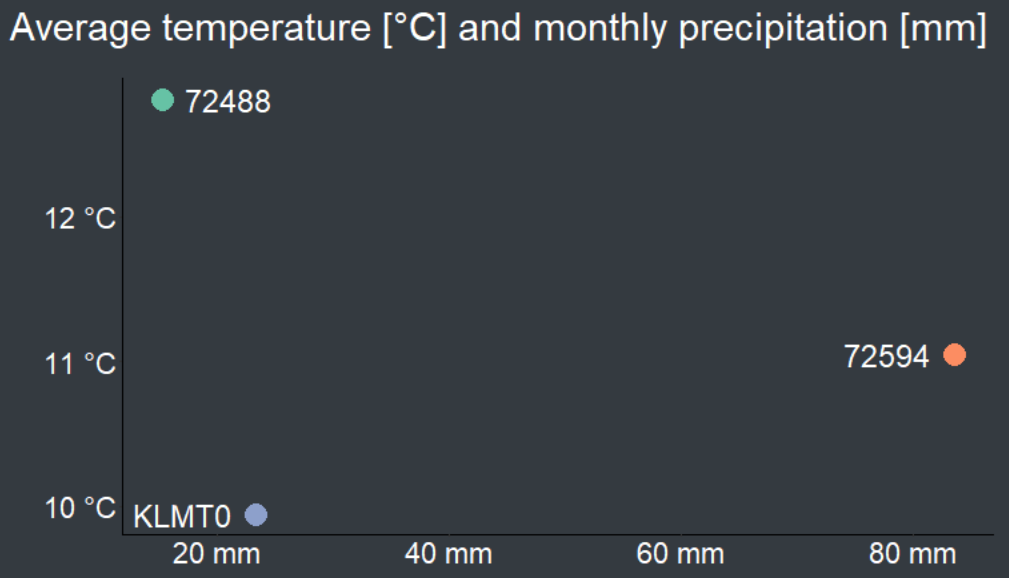
Drill Down Drill Up

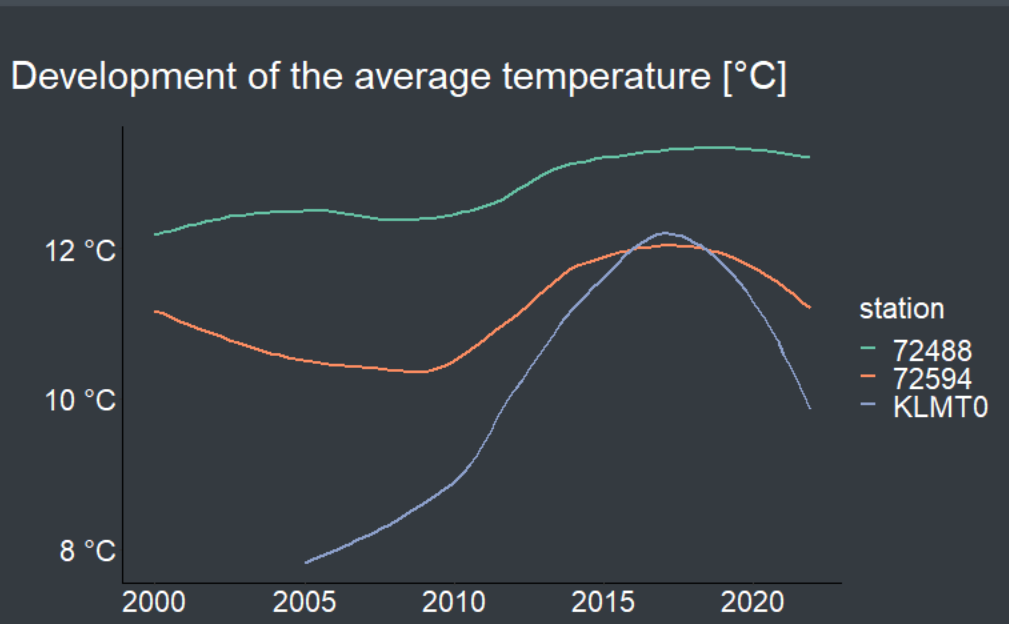


Average temperature [°C] and monthly precipitation [mm]

Development of the average temperature [°C]


Drill Down
Drill Up
+
−
Average temperature
10.0 °C
10.5 °C
11.0 °C
11.5 °C
12.0 °C
12.5 °C
13.0 °C
Leaflet


Average temperature [°C] and monthly precipitation [mm]
72488
72594
KLMT0
12 °C
11 °C
10 °C
20 mm
40 mm
60 mm
80 mm


Development of the average temperature [°C]
12 °C
10 °C
8 °C
2000
2005
2010
2015
2020
station
72488
72594
KLMT0

leafdown package

- ✓ Adds drilldown functionality to leaflet choropleths maps in Shiny
- ✓ Allows the selection of regions/shapes
- ✓ Enables communication of the map with other Shiny elements (e.g., graphs)
- ✓ Easy to use and well-integrated into the syntax of the leaflet package

GitHub: https://github.com/hoga-it/leafdown