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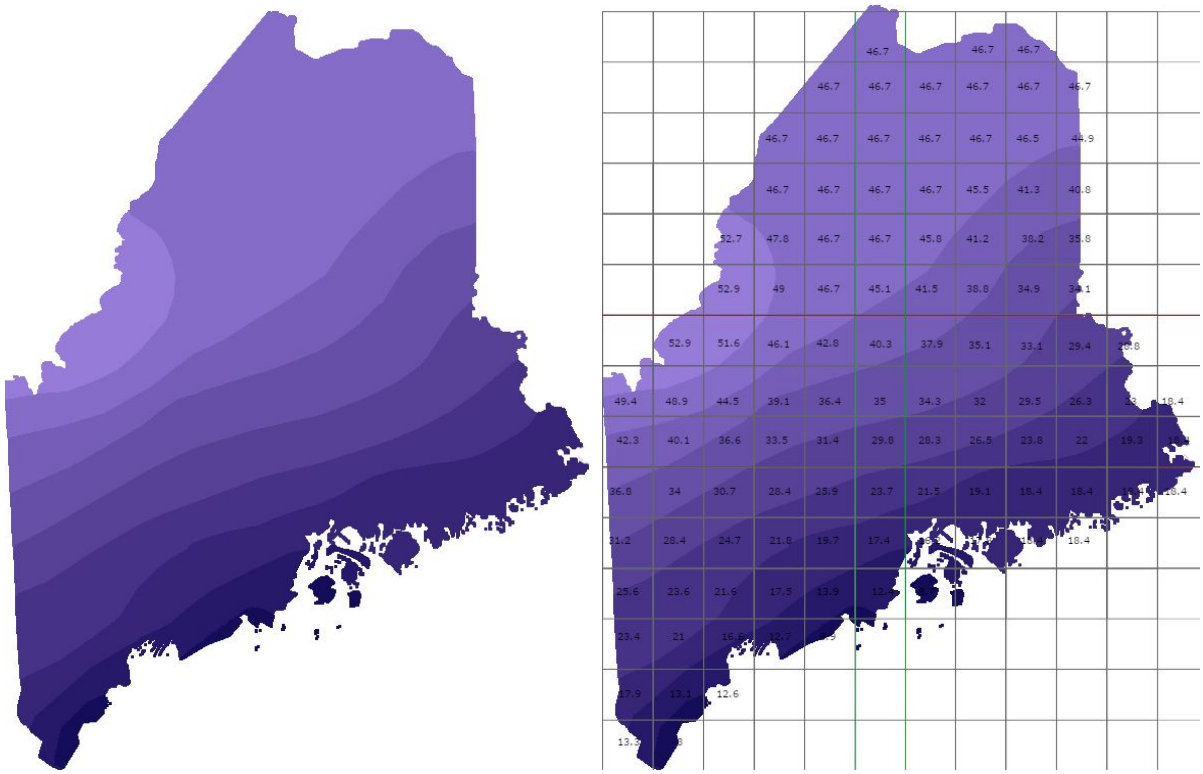
MATH 2025
Professor Horan

I chose this project because I am from Maine, and Maine is known for getting a lot of snow, so I thought it would be interesting to create a visualization of just how much snow it gets per year. I found a snowfall distribution map of the state of Maine in a post written by southern Maine's chief meteorologist.

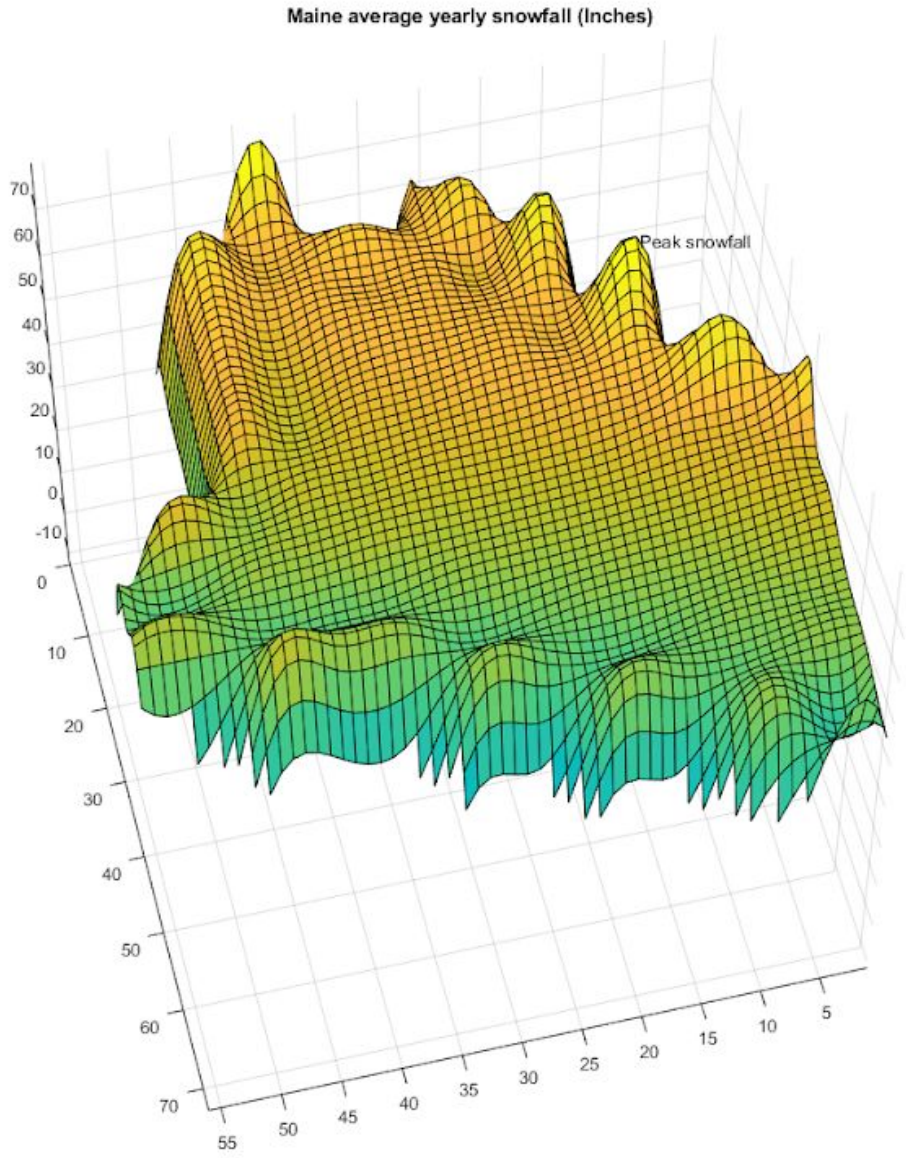
I then took this map, and mapped it to a flat map of Maine using photo editing software. From there, I placed a grid over the image and used built in analysis tools to average each grid square.



I then placed all of these values in their own arrays, and fed them to MATLAB with multiple interpolation methods.

```
x = 1:12;
y = 1:15;
xi = 1:0.2:12;
yi = 1:0.2:15;
[xi,yi] = meshgrid(xi,yi);
[x,y] = meshgrid(x,y);
z1 = [0,0,0,0,0,63.62,0,63.62,63.62,0,0,0]
z2 = [0,0,0,0,63.62,63.62,63.62,63.62,63.62,63.62,0,0]
z3 = [0,0,0,63.62,63.62,63.62,63.62,63.62,63.5,62.54,0,0]
z4 = [0,0,0,63.62,63.62,63.62,63.62,62.9,60.38,60.08,0,0]
z5 = [0,0,67.22,64.28,63.62,63.62,63.08,60.32,58.52,57.08,0,0]
z6 = [0,0,67.34,65,63.62,62.66,60.5,58.88,56.54,56.06,0,0]
z7 = [0,67.34,66.56,63.26,61.28,59.78,58.34,56.66,55.46,53.24,52.88,0]
z8 = [65.24,64.94,62.3,59.06,57.44,56.6,56.18,54.8,53.3,51.38,49.4,46.64]
z9 = [60.98,59.66,57.56,55.7,54.44,53.48,52.58,51.5,49.88,48.8,47.18,46.64]
z10 = [57.68,56,54.02,52.64,51.14,49.82,48.5,47.06,46.64,46.64,46.64,46.64]
z11 = [54.32,52.64,50.42,48.68,47.42,46.04,45.32,46.28,46.64,46.64,0,0]
z12 = [50.96,49.76,48.56,46.1,43.94,43.04,40.82,0,0,0,0,0]
z13 = [49.64,48.2,45.56,43.22,40.94,0,0,0,0,0,0,0]
z14 = [46.56,43.46,43.16,0,0,0,0,0,0,0,0,0]
z15 = [43.58,40.4,0,0,0,0,0,0,0,0,0,0]
z = [z1;z2;z3;z4;z5;z6;z7;z8;z9;z10;z11;z12;z13;z14;z15];
zn = interp2(x,y,z,xi,yi,'neville');
zc = interp2(x,y,z,xi,yi,'cubic');
zl = interp2(x,y,z,xi,yi,'lagrange');
zh = interp2(x,y,z,xi,yi,'makima');
zs = interp2(x,y,z,xi,yi,'spline');
surf(zs);
title('Maine average yearly snowfall (Inches)')
text(12,24,80,'Peak snowfall')
```

Personally, I found the cubic spline method to be the most visually appealing.



From the image I generated, I was surprised to see that the peak snowfall is not actually at the top of Maine, but there is a gradual decrease after you go above central Maine. It is also apparent that snowfall tends to be higher inland versus coastal, and perhaps that has something to do with the coast having more rain, rather than snow.

Snowfall data from:

Lopresti, Charlie, and CBS News. “Winter Forecast 2017-2018.” Check in with Charlie, 2 Nov. 2017, http://checkinwithcharlie.bangordailynews.com/2017/11/02/home/winter-forecast-2017-2018/.