Purpose of my project was to create maps that predicted skipjack tuna catch in the pacific.

I used the monthly data that is publicly available on the WCPFC website. This data captures catch by a 1x1 degree grid cell.

The environmental data I decided to use was salinity, chlorophyll, and sea surface temperature.

I wrote R code that looped through each month and year combination of my data set and extracted monthly environmental data for the entire fishing footprint.

I then matched the catch data to each environmental data set,so I had point measurements of chlorophyll, salinity, and sea surface temperature for each observation.

I built a really simplistic OLS model and regressed catch on the set measurements of chlorophyll, salinity, and sea surface temperature.

I then took the coefficient estimates from my model and applied them to the full spatial extent of environmental data to obtain maps of predicted skipjack tuna catch for the entire fishing footprint, for each month/year of my sample.

My final deliverable is this animation which shows predicted skipjack tuna catch for the pacific.

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The one flaw I was not able to correct was how I took the point measurements of the environmental data. The catch data is not at the set level, instead it represents a grid. However, the catch data is not a spatial data set, so the coordinates recorded are going to be the bottom left corner of the 1x1 degree grid. When I read that into R as a spatial data set, R reads it as a spatial points data set and not a polygon. So when I overlap the catch data with the environmental data, the environmental data attached is going to be the values recorded at that bottom left corner of the grid. But catch can occur anywhere in that 1x1 degree grid and the values of the environmental data set might vary within that 1x1 degree grid.

Ideally, I would have transformed the catch data into a spatial polygon and then intersected it with the environmental data. In this case I would have had a handful of values for each catch observation, and I could average them. So each observation would have the average chlorophyll value or sea surface temperature value for that 1x1 degree grid.