

# Alaskan Salmon

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# Hypothesis

There is a significant correlation between the climate change occurring and the quality of salmon caught in Alaska

# Why is this important?

- **Largest harvest in North America:**
  - Alaska's salmon harvest is the largest in North America, accounting for about 80% of the total wild-caught catch.
- **Employment:**
  - More Alaskans work in salmon harvesting and processing than in any other commercial fishery.
- **Economics:**
  - Salmon accounts for the majority of the value of Alaska seafood.

# Industry Challenges

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# 1. Inflation

- a. High inflation and interest rates have squeezed profit margins



# 2. Labor costs

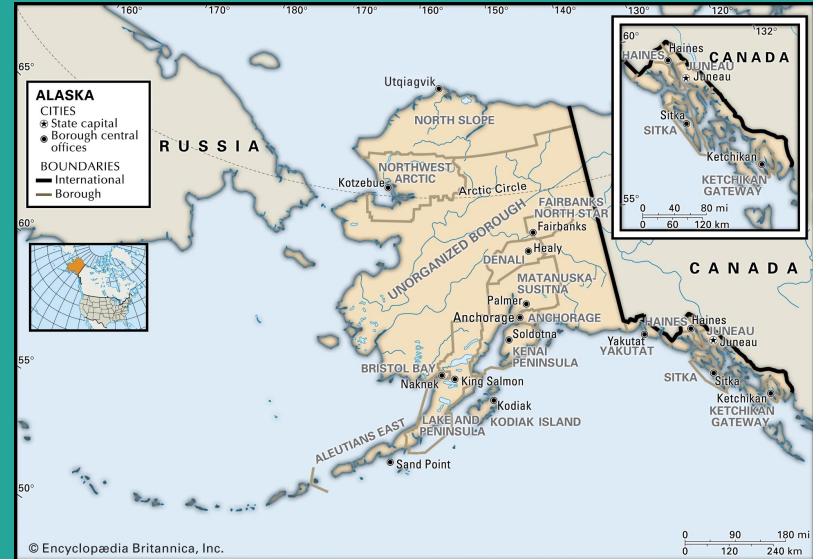
- a. Wages continue to rise

# 3. Fuel concerns

- a. Diesel fuel prices continue to rise

# 4. Geographical competition

- a. Alaskan fisherman compete against foreign imports



# Data

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# Salmon Datasets

## Variables

- Year (month, day)
- Longitude, Latitude
- Transect (company selling salmon)
- Measurements (frozen & wet)
  - Length(cms) & Weight(grams)
- Sex & Maturity

BCO-DMO BCO-DMO ERDDAP Accessing BCO-DMO data <span>log in Brought to you by BCO-DMO</span>																			
year	transect	sta_id	haul_id	month_local	day_local	yday_local	latitude	longitude	depth_w	species_common_name	length_froz	length_wet	weight_froz	weight_wet	sex	maturity	stomwt_full	stomwt_empty	
dimensionless	dimensionless	dimensionless	dimensionless	dimensionless	dimensionless	dimensionless	degrees_north	degrees_east	meters	dimensionless	?	?	grams	grams	dimensionless	dimensionless	grams	?	d
2001	Icy_Point	IP2	2001001	07	17	198	58.2	-137.2	64.0	Chinook		120		127	J		0	0	
2001	Icy_Point	IP2	2001001	07	17	198	58.2	-137.2	64.0	Chum		698		4108	M	A	0	0	
2001	Icy_Point	IP2	2001001	07	17	198	58.2	-137.2	64.0	Chum	111		1		J		0	0	
2001	Icy_Point	IP2	2001001	07	17	198	58.2	-137.2	64.0	Chum	102		10		J		0	0	
2001	Icy_Point	IP2	2001001	07	17	198	58.2	-137.2	64.0	Chum	100		9		J		0	0	
2001	Icy_Point	IP2	2001001	07	17	198	58.2	-137.2	64.0	Chum	114		12		J		0	0	
2001	Icy_Point	IP2	2001001	07	17	198	58.2	-137.2	64.0	Chum	111		9		J		0	0	
2001	Icy_Point	IP2	2001001	07	17	198	58.2	-137.2	64.0	Chum	111	112	13	14	J		0	0	
2001	Icy_Point	IP2	2001001	07	17	198	58.2	-137.2	64.0	Chum	126		19		J		0	0	
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2001	Icy_Point	IP2	2001001	07	17	198	58.2	-137.2	64.0	Chum	130		18		J		0	0	
2001	Icy_Point	IP2	2001001	07	17	198	58.2	-137.2	64.0	Chum	118		17		J		0	0	

Biological & Chemical Oceanography Data Management Office

<https://www.bco-dmo.org/dataset/3106>

Queried the Salmon biodata

[https://erddap.bco-dmo.org/erddap/tabledap/bcodmo\\_dataset\\_3106.htmlTable](https://erddap.bco-dmo.org/erddap/tabledap/bcodmo_dataset_3106.htmlTable)

# Climate Datasets

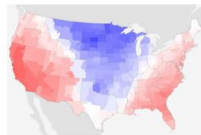
## Past Weather by Zip Code

<https://www.climate.gov/maps-data/dataset/past-weather-zip-code-data-table>

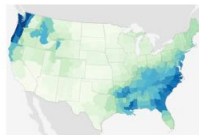
## NASA - ClimateData Services

<https://www.nceps.nasa.gov/services/climate-data-services>

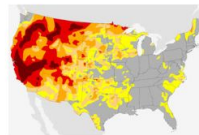
### Data Snapshots



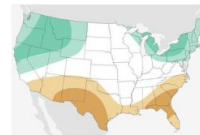
Temperature



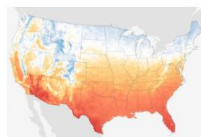
Precipitation



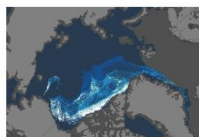
Drought



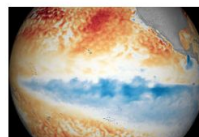
Outlooks



Projections



Ice & Snow



Oceans



Severe Weather



# Statistical Analysis

- **Data Acquisition**
  - **Collect Salmon Biodata**
  - **Integrate Environmental Data**
- **Correlation & Hypothesis Testing**
  - **Analyze relationships between environmental factors and Salmon characteristics through the years**
- **Predictive Modeling/Trend Analysis**
  - **Example: linear regression to model the impact of environment variables on salmon size and eventually quality**

# Future Developments

- **Economic Impact**
  - Forecast grocery pricing
  - One of the top industries for Alaska
- **Climate Change Studies**
  - Expand data
    - Ocean pH & oxygen levels
- **Geographical Impact**
  - How does fishing here affect the ecosystem?

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    - Good or Bad?

# Key Takeaways



- **Statistical analysis reveals potential correlations between climate change factors**
  - **Temperature, sea level, and salmon quantity/quality.**
- **Python to visualize all of this data for a dashboard**
  - **Any industry that is impacted by this study can easily read through and extract how this impacts them and their field**
- **Analysis and expand to other farming practices.**
  - **Other Countries/States, Businesses, Forecasting costs and profits**

