

# Thematic trends associated with oil well cost components

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## **OBJECTIVE :**

Understand the thematic trends associated with oil well cost components associated with some regions in the United States and develop informed predictions on the same

# Data Understanding :

Driving Variables
Date
Index Category
Region
Index

# Data Understanding :

Average cost Index breakdown for U.S. regions oil well cost components

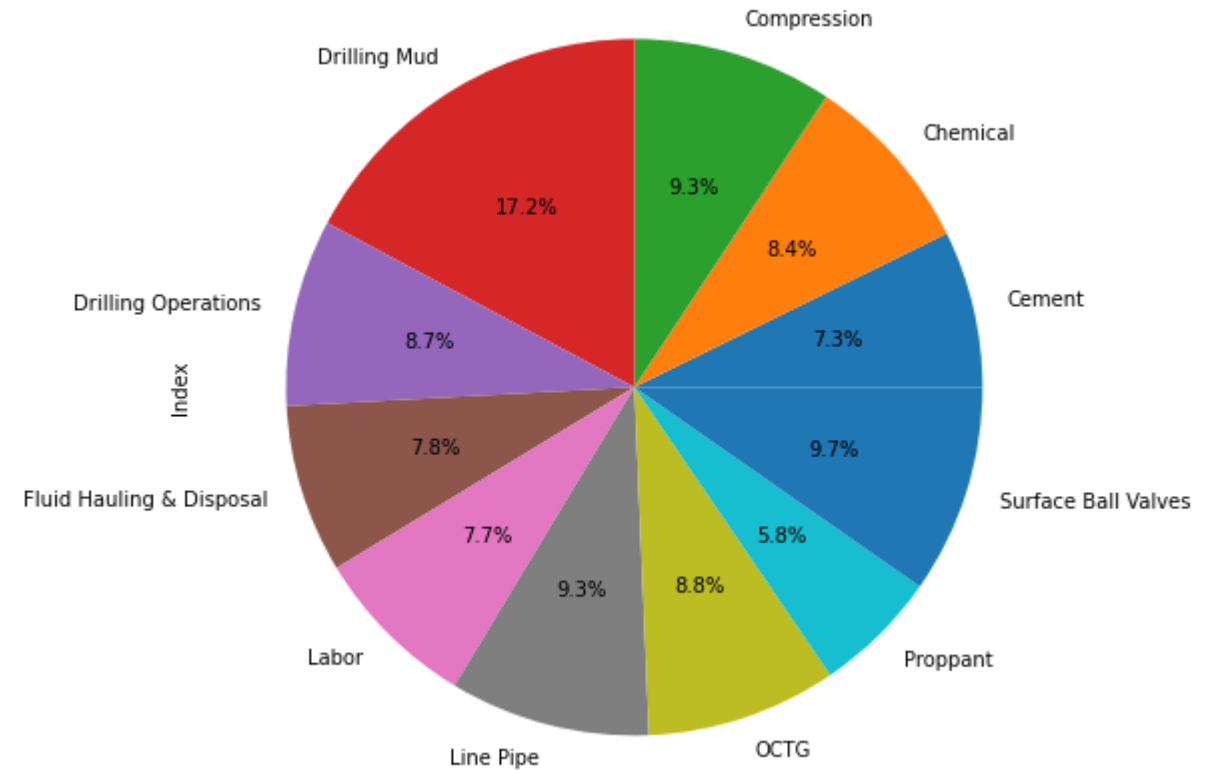
## Major Contributors :

Drilling Mud/Fluids Cost Index (17.2%)

Surface Ball Valves (9.7%)

Compression (9.3%)

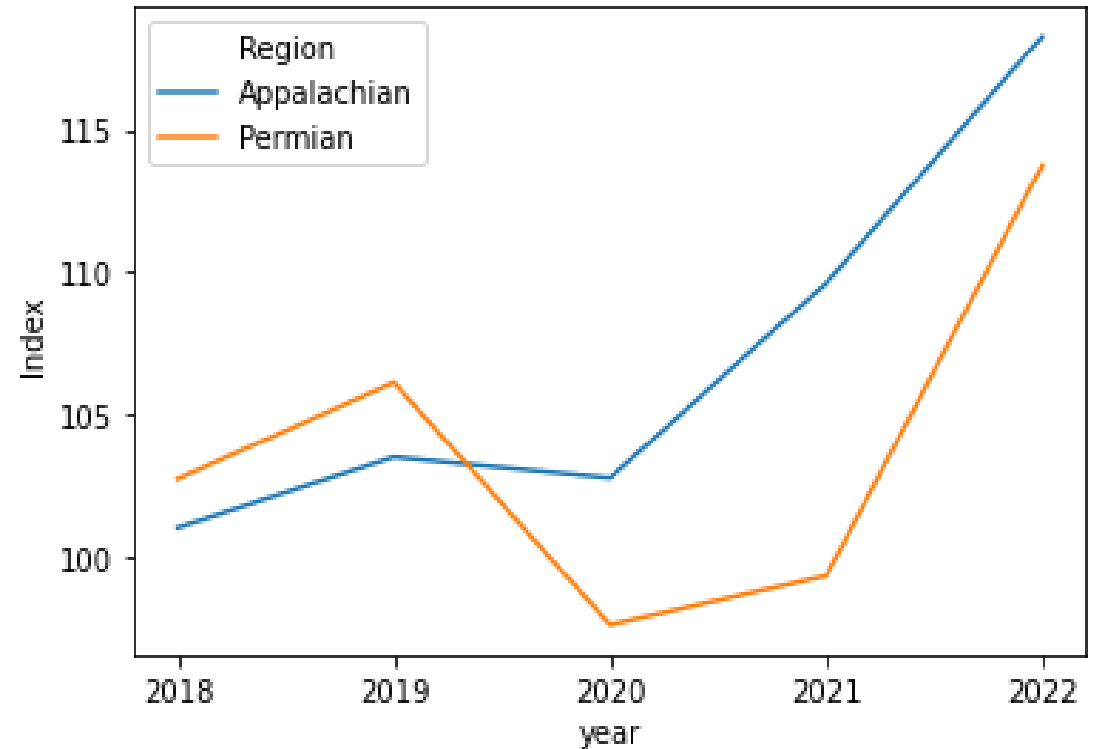
Line Pipe (9.3%)



# Data Understanding :

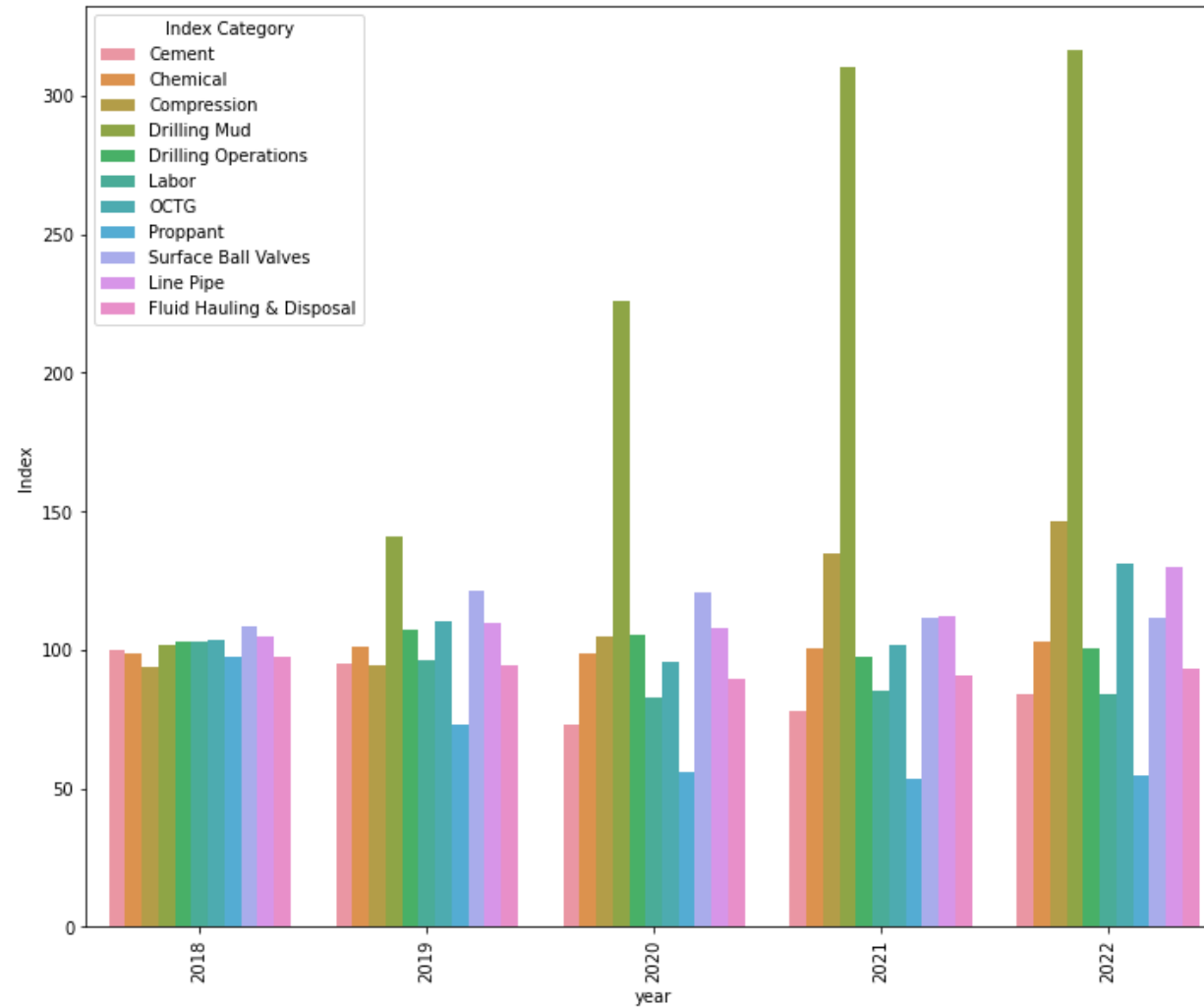
## Historical Average Cost Index Variation for Different Regions

- Cost Index has fallen from 2019 to 2020, largely due to the impact of the Covid pandemic on energy demand
- Appalachian Region has Higher Average Cost Index than Permian Basin.
- In year 2020, Appalachian basin tops Permian as biggest methane emitting region in the US (Source : World Oil Magazine)



# Data Understanding :

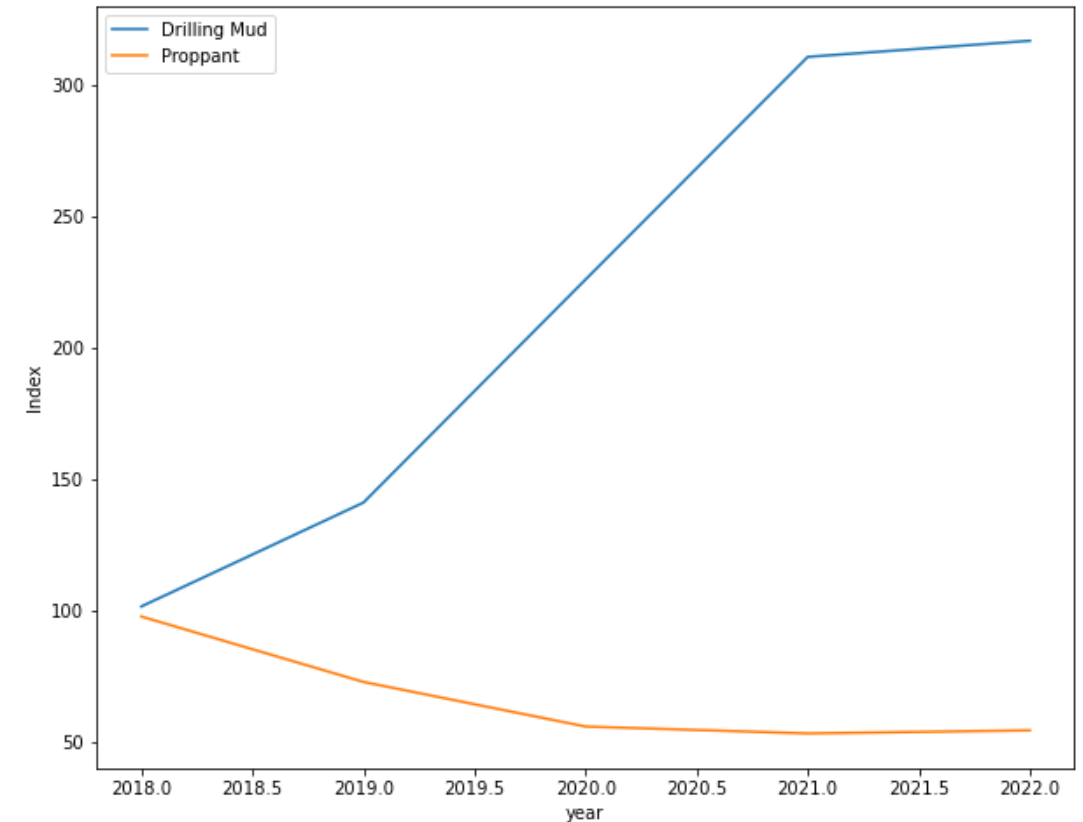
Variation of Average Cost Index for different Categories over the year



# Data Understanding :

## Variation of Average Cost Index for different Categories over the year

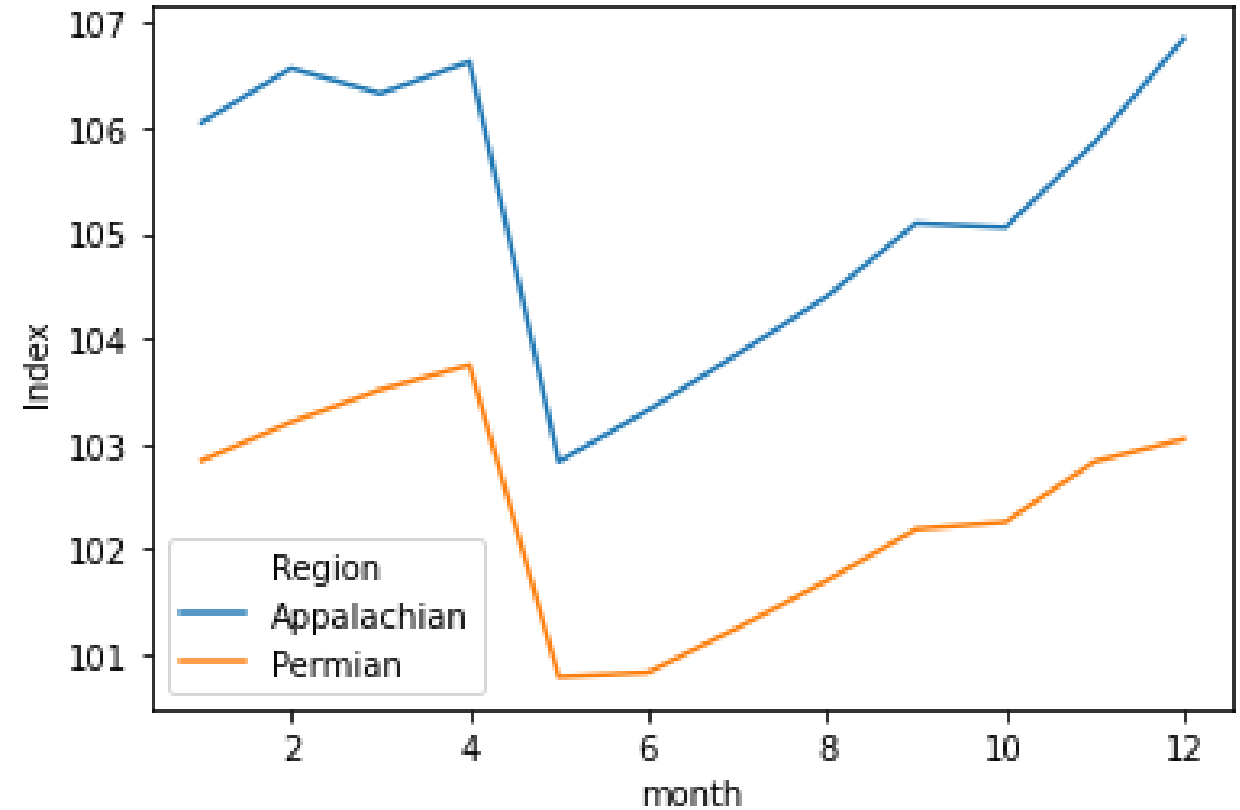
- Contribution of Drilling Mud towards Cost Index is increasing year by year due to increased demand for energy and increase in drilling processes for oil exploration
- The proppant industry is facing number of challenges significantly around sand logistics, High costs to transport.
- By choosing more localized sources of fracturing sand, operators can reduce the cost of operation, ultimately improving the economics around the lower margins of the recovering prices.
- Hence Decreasing trend in Proppant category is observed



# Data Understanding :

## Average Cost Index Variation per Month for Different Regions

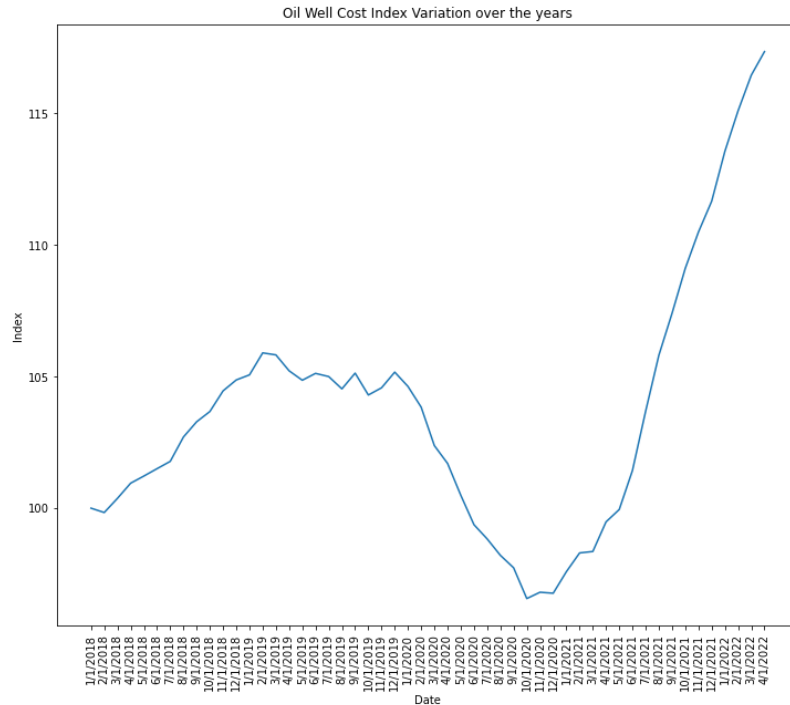
- Average Cost Index is falling in May and June for every year
- This might be due to summer Vacations in month of May and June





# Data Understanding :

## Effect of Oil Cost Index on Inflation rate



Oil Well Cost Index



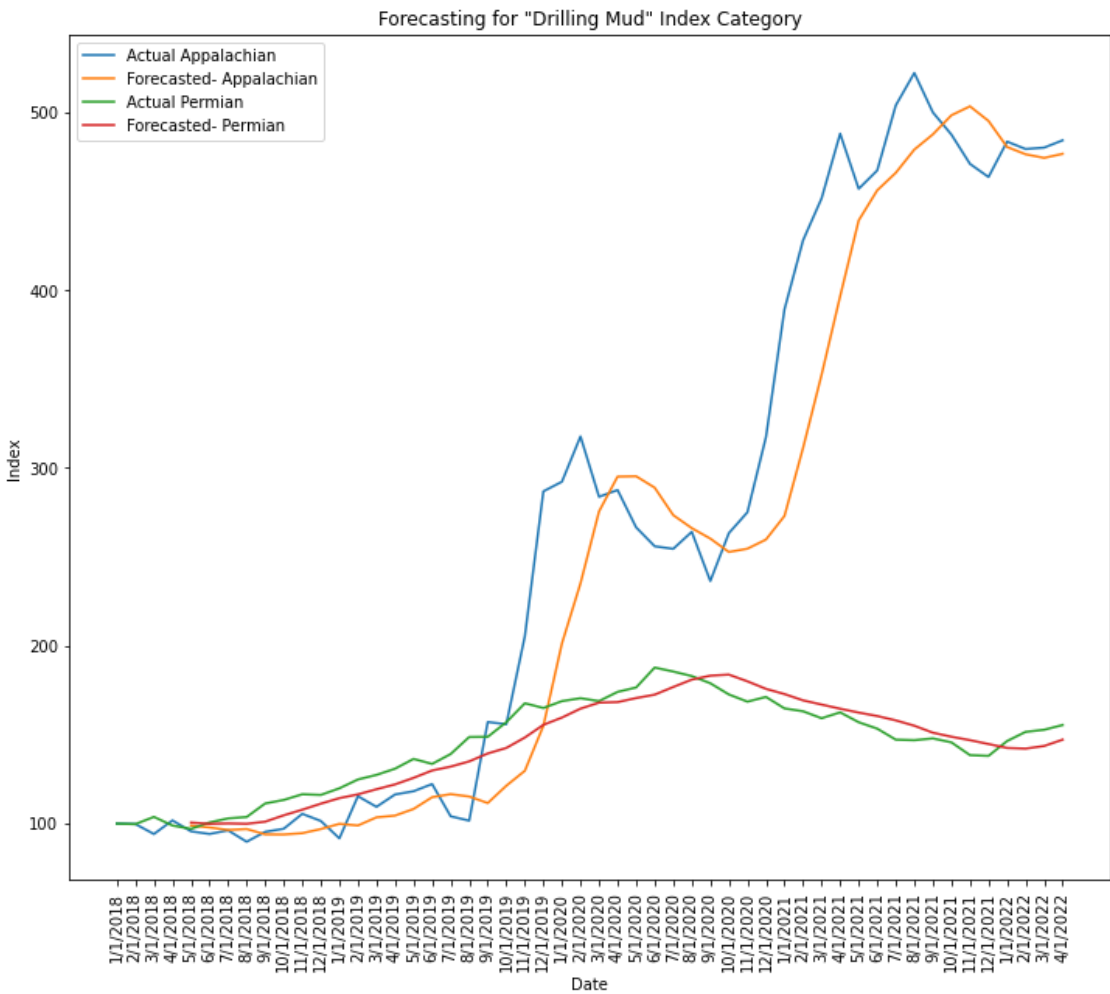
Inflation Rate

Similar trend is observed in both graphs. Hence we can say that, Crude oil is a major economic input, so a rise in oil cost index contributes largely to inflation, which measures the overall rate of price increases across the economy.

# Forecasting for Drilling Mud Category :

“Drilling Mud” index Category contributes largely towards Oil Cost Index. Time series forecasting is done for this Category using Simple moving Average

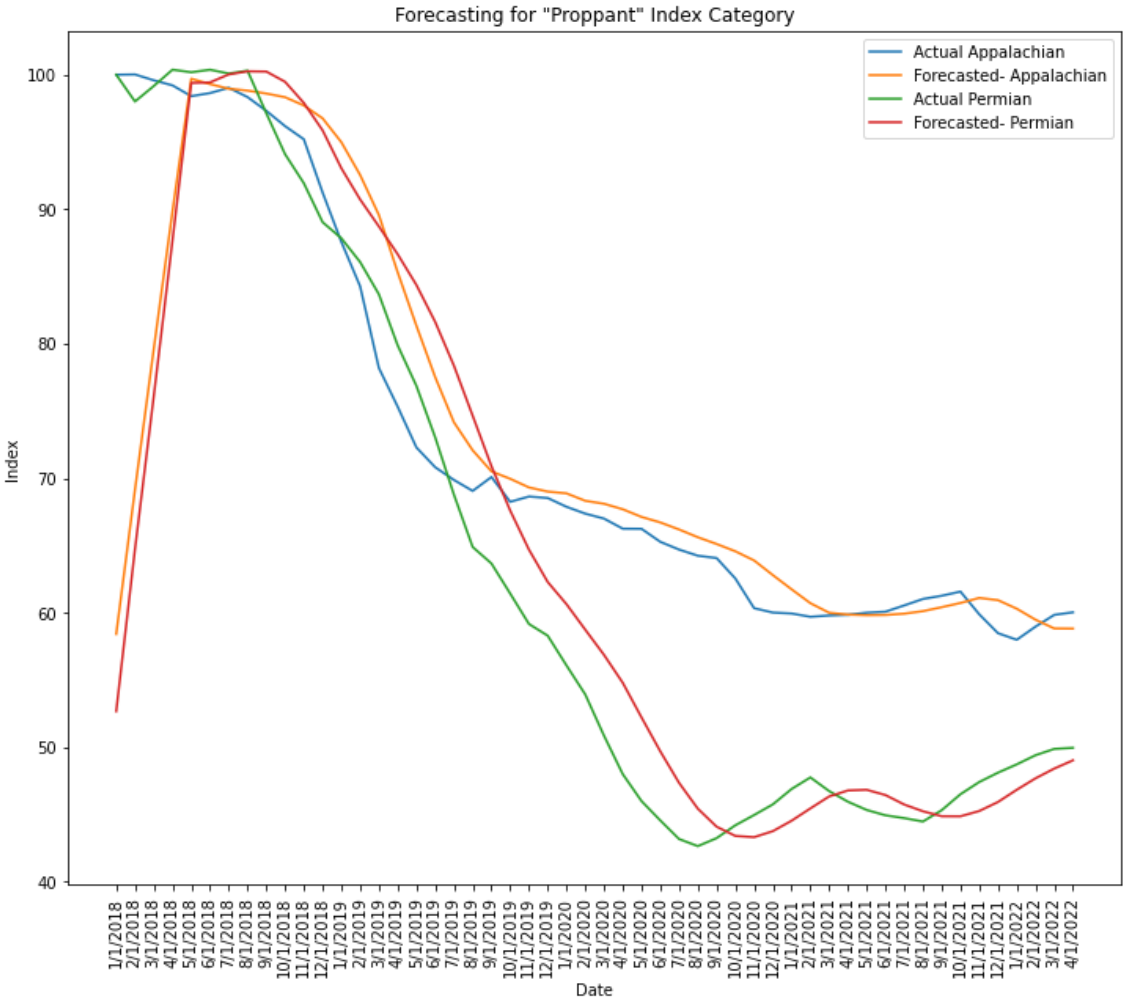
Region	Mean Absolute % Error	Root Mean Square Error
Appalachian	8.65	50.5
Permian	4.33	7.36



# Forecasting for Proppant Category :

“Proppant” index Category contributes least towards Oil Cost Index. Time series forecasting is done for this Category using Simple moving Average

Region	Mean Absolute % Error	Root Mean Square Error
Appalachian	4.5	7.85
Permian	7.22	9.2



# Conclusions :

- “Drilling Mud” Index Category Contributes largely towards Oil Cost Index (17.2%) followed by Surface Ball Valves (9.7%), Compression (9.3%), Line Pipe (9.3%)
- Contribution of “Proppant” Index is decreasing year by year due to shift towards more localized sources of Fracturing Sand.
- Appalachian Region has Higher Average Cost Index than Permian Basin.
- Average Cost Index is falling in May and June for every year.
- Crude oil is a major economic input, so a rise in oil cost index contributes largely to inflation