**After PCA**

**3 PC**

Gap Statistic

Chart, line chart

Description automatically generated

Mean Cluster Values

Text, letter

Description automatically generated

Silhouette Plot

Chart

Description automatically generated

Geo Plot

Map

Description automatically generated

**4 PC**

Gap Statistic

Chart, line chart

Description automatically generated

Mean Cluster Values

Text

Description automatically generated

Silhouette Plot

Chart, funnel chart

Description automatically generated

Geo Plot

Map

Description automatically generated

5PC

Gap stat

Chart, line chart

Description automatically generated

Mean Cluster Values

Text, letter

Description automatically generated with medium confidence

Silhouette Plot

Chart, funnel chart

Description automatically generated

Geo Plot

**Map

Description automatically generated**

**Before PCA**

Gap Statistic

Chart, line chart

Description automatically generated

Mean Cluster Values

Text

Description automatically generated with medium confidence

Silhouette Plot

Chart

Description automatically generated

Geo Plot

Map

Description automatically generated

Result tables

1. Comparison among different number of PC for Hierarchical

|  |  |  |  |
| --- | --- | --- | --- |
|  | 3 PC | 4 PC | 5 PC |
| % of variance explained | 76.13% | 87.20% | 94.53% |
| Gap Statistic (Num clusters) | 3 | 4 | 3 |
| Silhouette Score | 0.24 | 0.32 | 0.23 |
| Map | Map  Description automatically generated | Map  Description automatically generated | **Map  Description automatically generated** |

1. Comparison between Hierarchical and K means

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | K means (whole data) | K means  (4PC) | Hierarchical (whole data) | Hierarchical (4PC) |
| Silhouette Score |  |  | 0.25 | 0.32 |
| Map |  |  |  |  |