



# Water Quality Assessment in the Eastern Niger Delta Region of Nigeria

Medina Kadiri  
Department of Plant Biology &  
Biotechnology, University of Benin  
Benin City, Nigeria

# Introduction

Niger Delta = Area where River Niger enters the Atlantic Ocean

Geographically distinctive, situated between latitude 3-9 degrees E & longitude 4 deg. 3 in -7 deg 20 in N

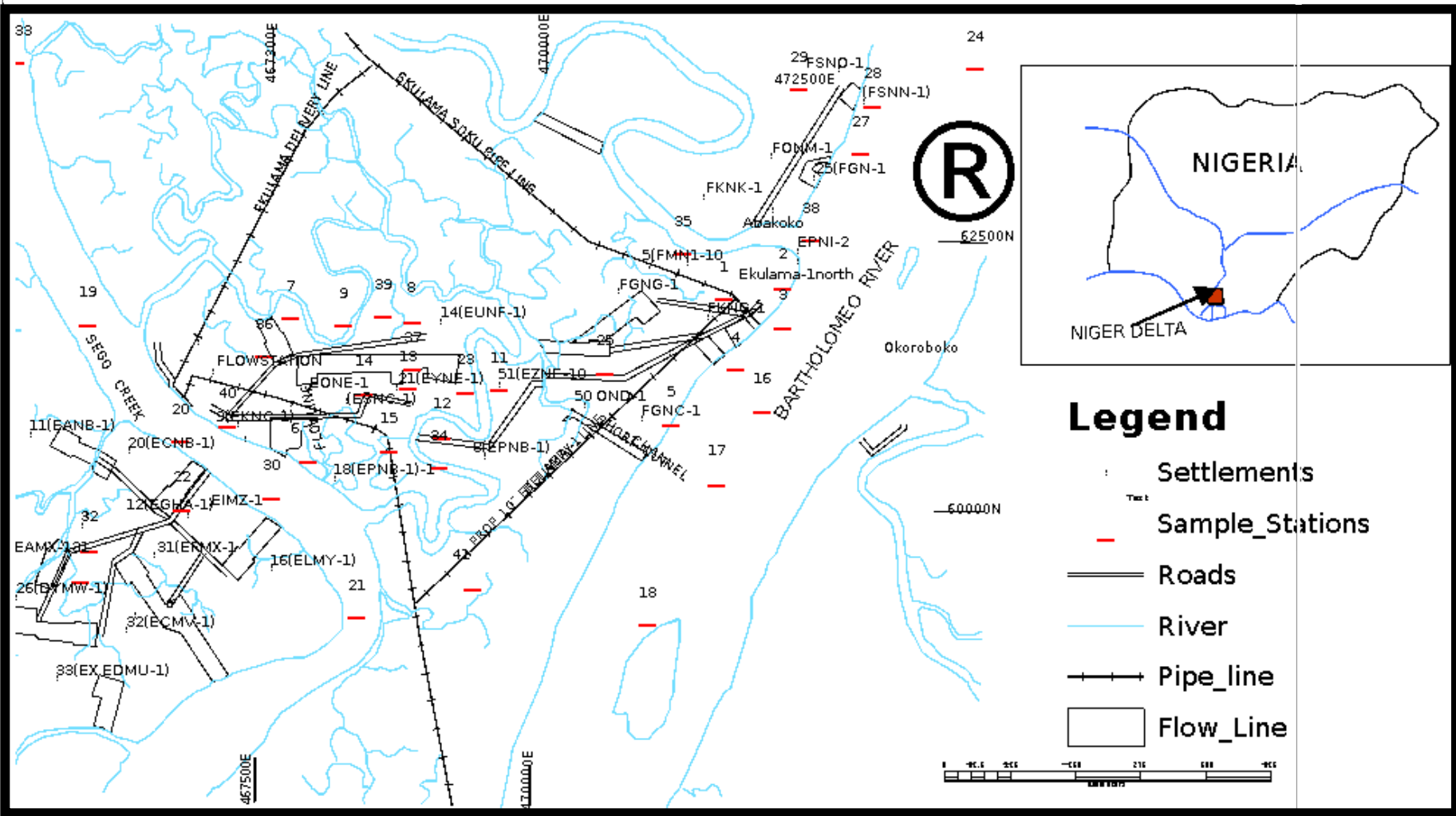
## Importance

- One of the largest deltas in the world (Area=70,000km<sup>2</sup>)
- Comprises 4 ecological zones: Coastal barrier island, Mangrove forests, Freshwater swamps & Lowland rainforest

- Harbours World's third largest and Africa's largest contiguous mangrove swamp forests
- Freshwater swamp of Niger Delta (11,700km<sup>2</sup>) is the most extensive in West & Central Africa (Moffat & Linden, 1995)
- Endowed with immense natural resources, particularly crude oil which is the main stay of Nigerian economy

# Study Area

42 sites were selected for study to cover different ecological zones between two water bodies- Sego creek and Bartholomeo River



### Legend

- Settlements
- Sample Stations
- Roads
- River
- Pipe\_line
- Flow\_Line

# Materials & Methods

Water samples collected in the field and determined for

- ***In situ* parameters:**

Temp

pH

Conductivity

TDS

- **Others**

Color, Turbidity, Alkalinity, Salinity, Hardness, Mg, Ca, DO, N, K, Si, Cl,  $\text{SO}_4$ ,  $\text{PO}_4$ ,  $\text{NO}_3$

# Results

## Some Physical & Chemical Variables

Variable	Range
Color (PtCoU)	2-57
Turbidity (NTU)	1-46
TDS (mg/l)	2,110 -8,695
pH	6.2 -7.4
Conductivity (mS/cm)	4.22 -18.26
Alkalinity (mg/l)	22 -49
Salinity (ppt)	3.1 -11.6
T. Hardness (mg/l)	700 - 120,000
Sulphate (mg/l)	200-1,225



### **3 Distinct groups:**

Group 1

Conductivities 4.22-5.05 mS/cm

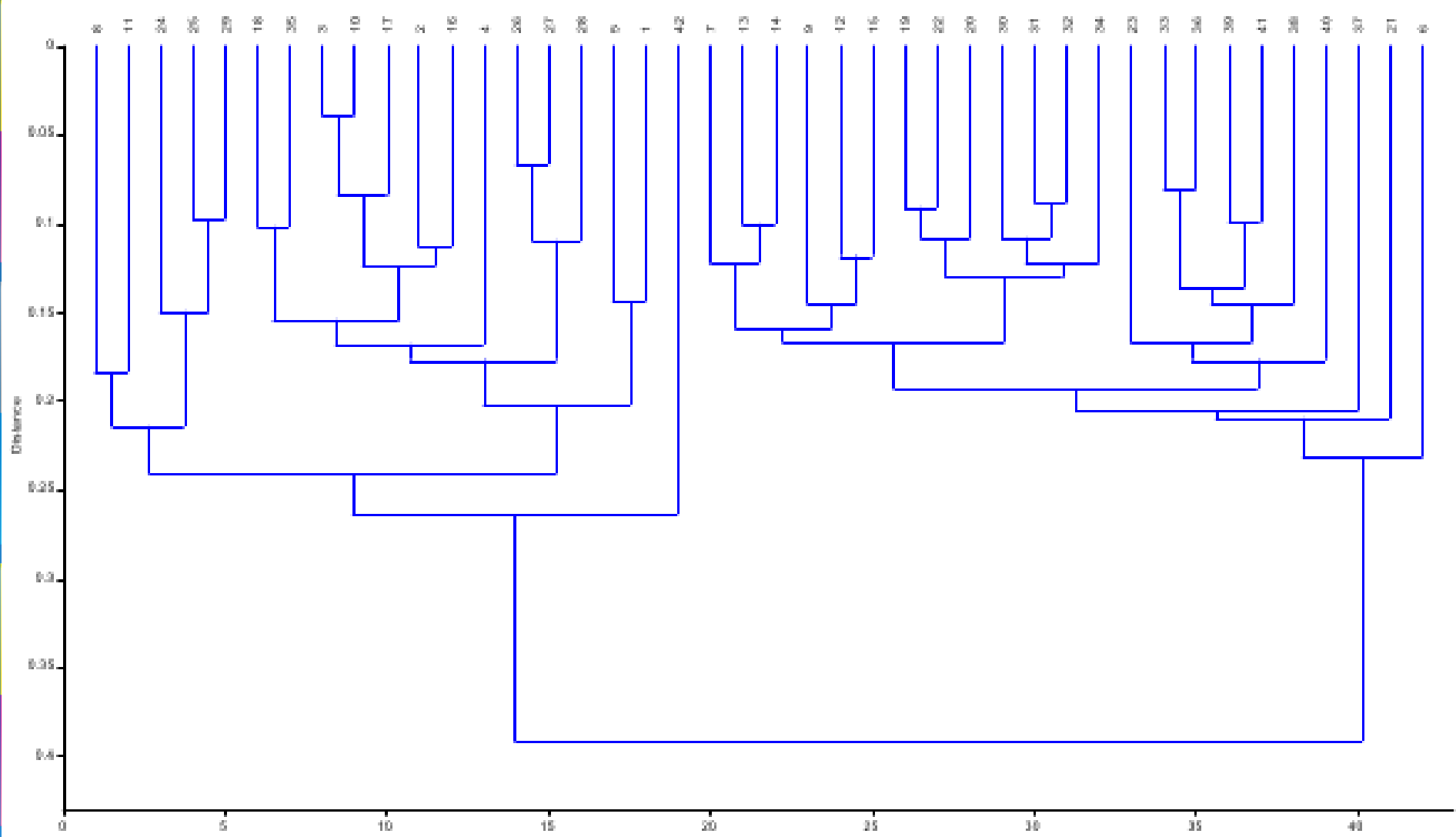
Group 2

5.78-9.28mS/cm

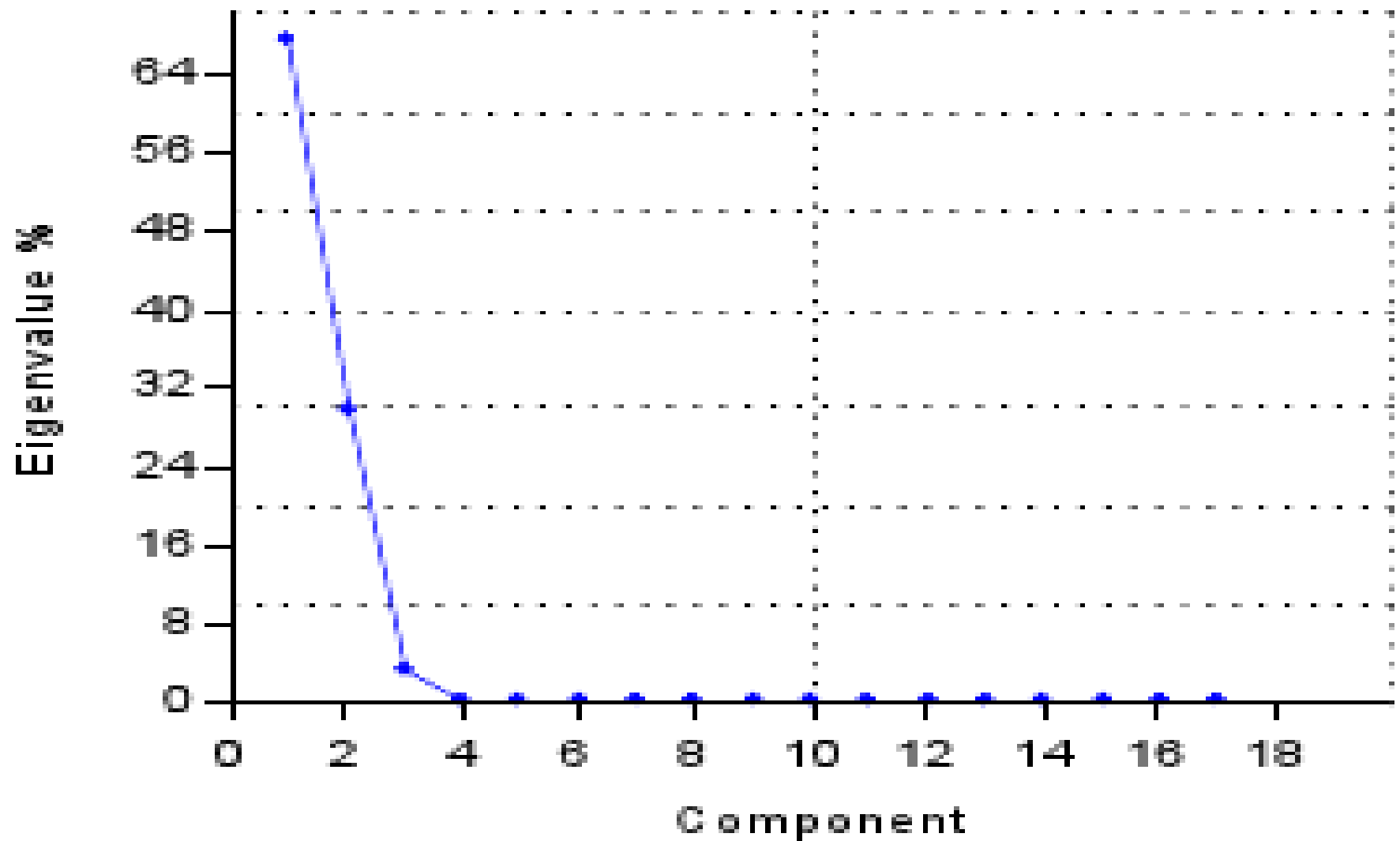
Group 3

11.96-18.26mS/cm

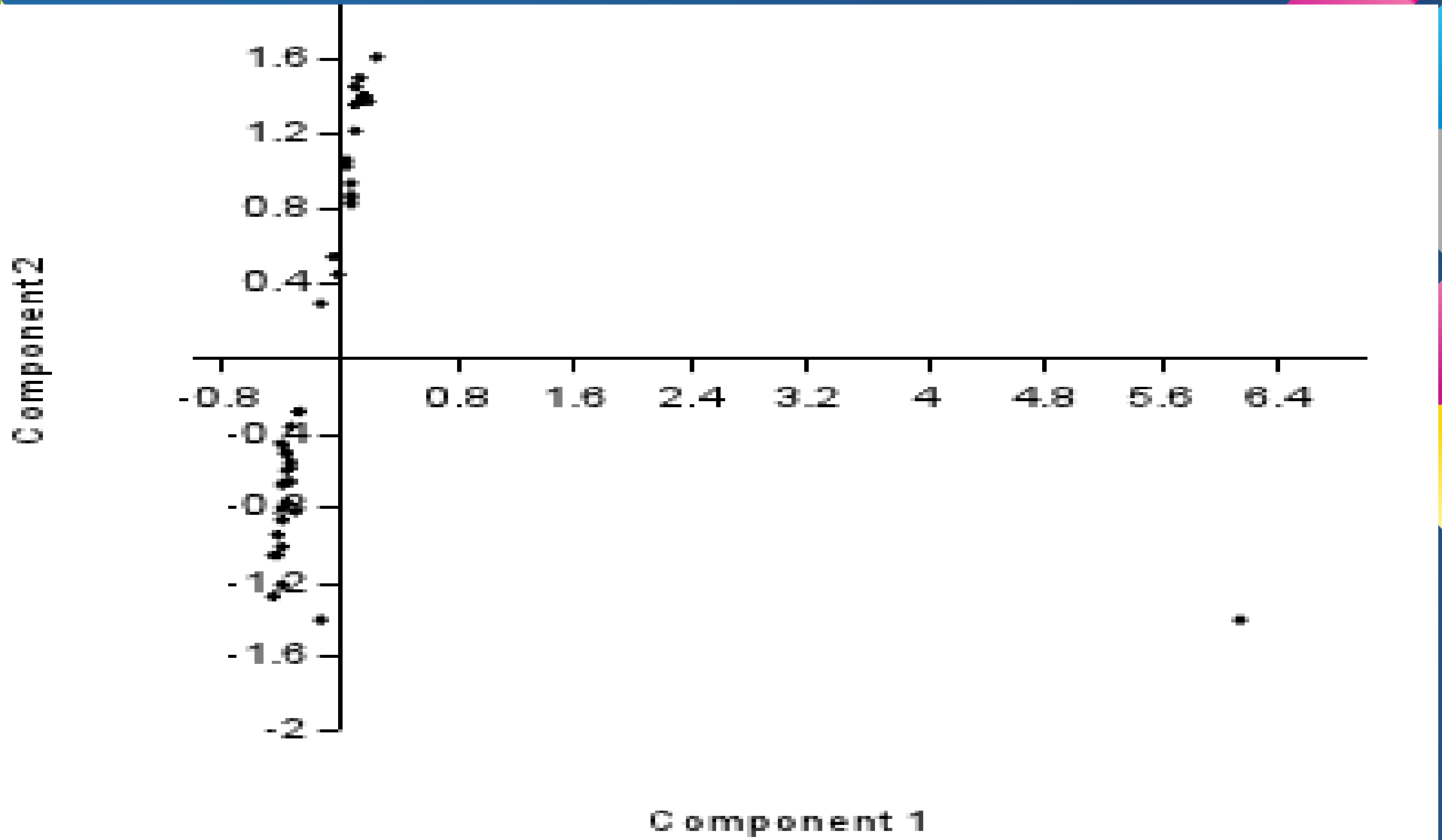




**Dendrogram of Study Sites**



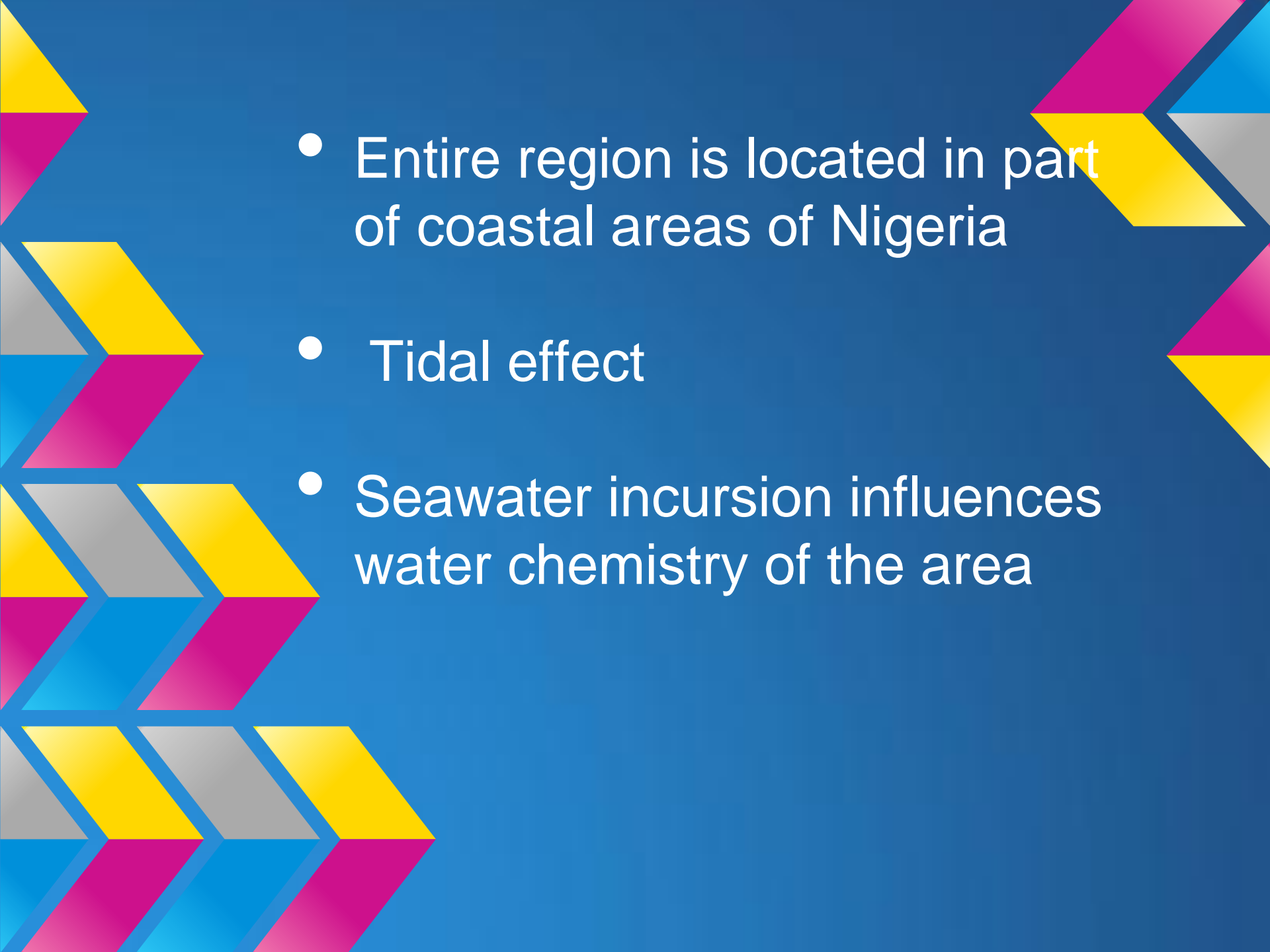
Scree Plot of Components



Scattergram of major Components

# Discussion

- High Variability in water quality characteristics owing to diverse nature of the ecosystem
- Sites along Bartholomeo River were high in conductivities and salinities (12.7-15.38mS/cm)
- Sites along Sego Creek were much lower in conductivities and salinities (3.03-8.25mS/cm)

- 
- Entire region is located in part of coastal areas of Nigeria
  - Tidal effect
  - Seawater incursion influences water chemistry of the area

The image features a solid blue background with decorative geometric patterns in the corners. The top-left and bottom-left corners contain a series of overlapping, colorful shapes (yellow, magenta, cyan, and grey) that form a larger, abstract arrow-like shape pointing towards the center. The top-right and bottom-right corners also feature similar, though less complete, geometric patterns. The text "Thank you for listening" is centered diagonally across the middle of the page.

Thank you for listening