Shoreline Change Analysis for Gulf of Khambhat using ArcGIS

20BCE050, 20BCE066, 20BCE192 and 20BCE204

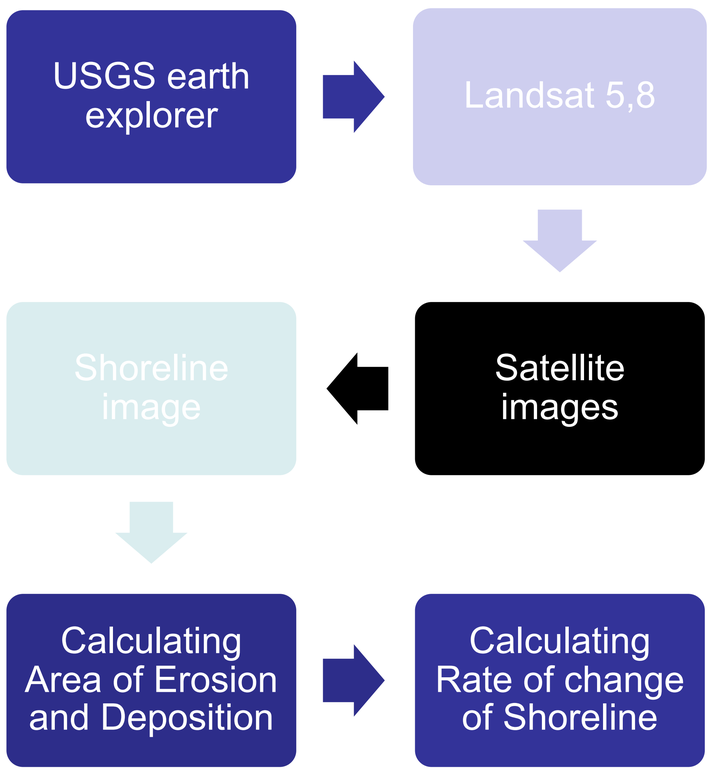
Abstract

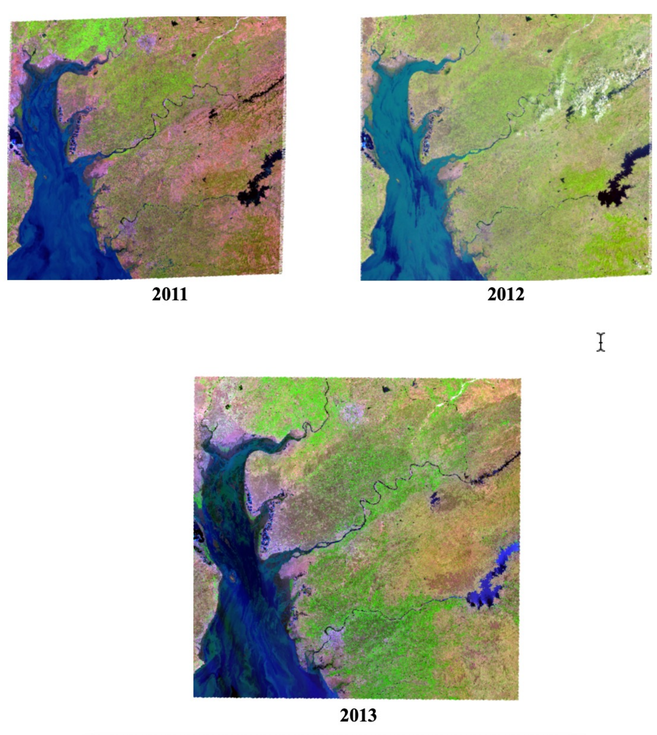
Coastal phenomena are a significant cause for concern due to their impact on the morphology of shorelines. These changes can result in the transportation of sediment along the coast, making it crucial to identify areas and rates of erosion and deposition caused by wave action. This can be achieved by regularly monitoring the coastline through satellite surveillance. The aim of this study was to assess short-term shoreline modifications between 2011 to 2013 in the Gulf of Khambhat, using half-yearly periodic intervals. The research employed Remote Sensing datasets from USGS and conducted imagery analysis using ArcGIS and DSAS.

Objective

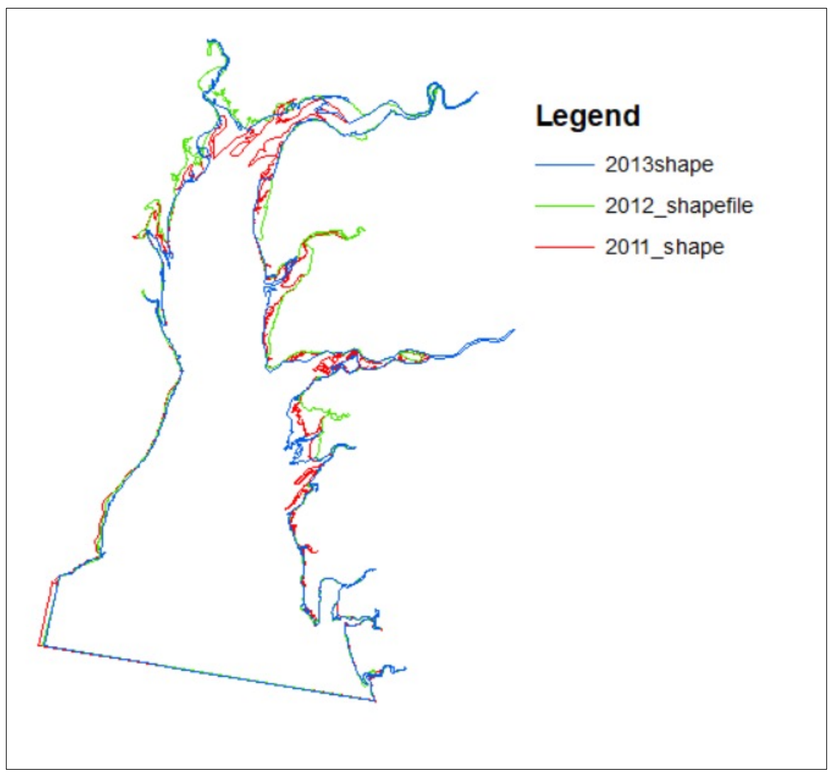
The region of interest selected for this project is Gulf of Khambhat shoreline of Gujarat, India. This shoreline is present in coastal region Saurashtra of Gujarat. The objective of the project is to calculate shoreline changes happened in various years and calculating area of erosion and deposition. This task has been performed for various years with a time gap of 1 year from 2011 to 2013.The satellite used for this purpose is LANDSAT-5 and LANDSAT-8.

Methodology





Satellite images of Gulf of Khambhat



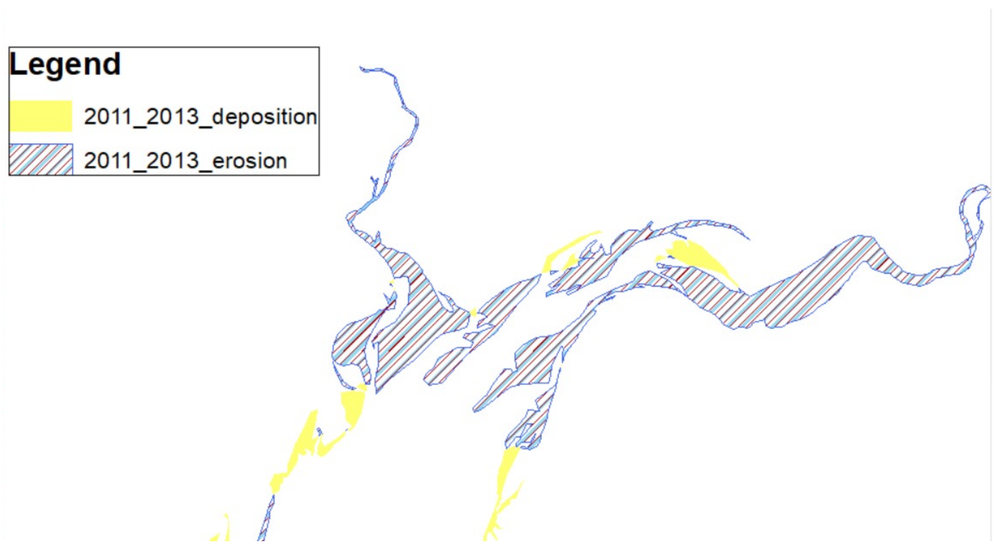
Polyline shapefiles of shorelines of different years

Expected Results

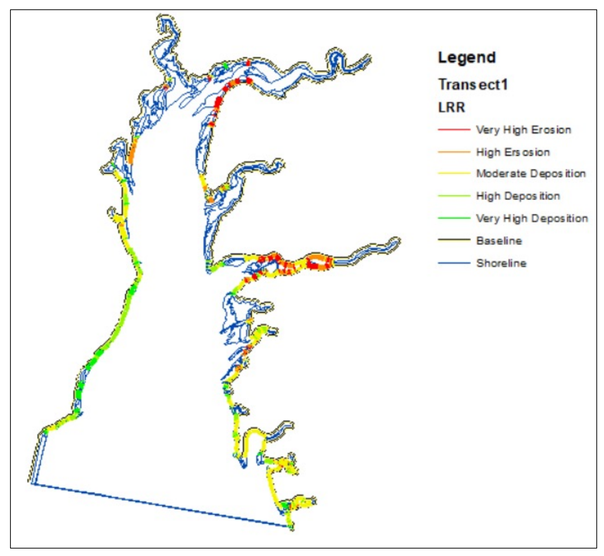
Created Polyline and polygon shapefiles

Calculated Area of erosion and deposition for consecutive years

Computed Rate of shoreline change using DSAS Tool



Area of Erosion and decomposition



Rate of Shoreline Change using DSAS

Outcomes

DATE	AREA OF EROSION (km2)	AREA OF DEPOSITION (km2)
30/1/11-14/11/11	596.62	84.71
14/11/11- 25/04/13	59.58	599.01
30/01/11-25/04/13	300.97	312.72

Bibliography/ References

DSAS tool https://youtu.be/hYmNz9mkN2I
ArcGIS https://youtu.be/BbUctneHfKc
Band composite and Mosaic https://youtu.be/I5sa24JjC2A
USGS Link https://earthexplorer.usgs.gov/

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