ASSESSMENT ON SEA LEVEL RISE IMPACT ALONG CUDDALORE COAST USING GEOSPATIAL TECHNIQUES

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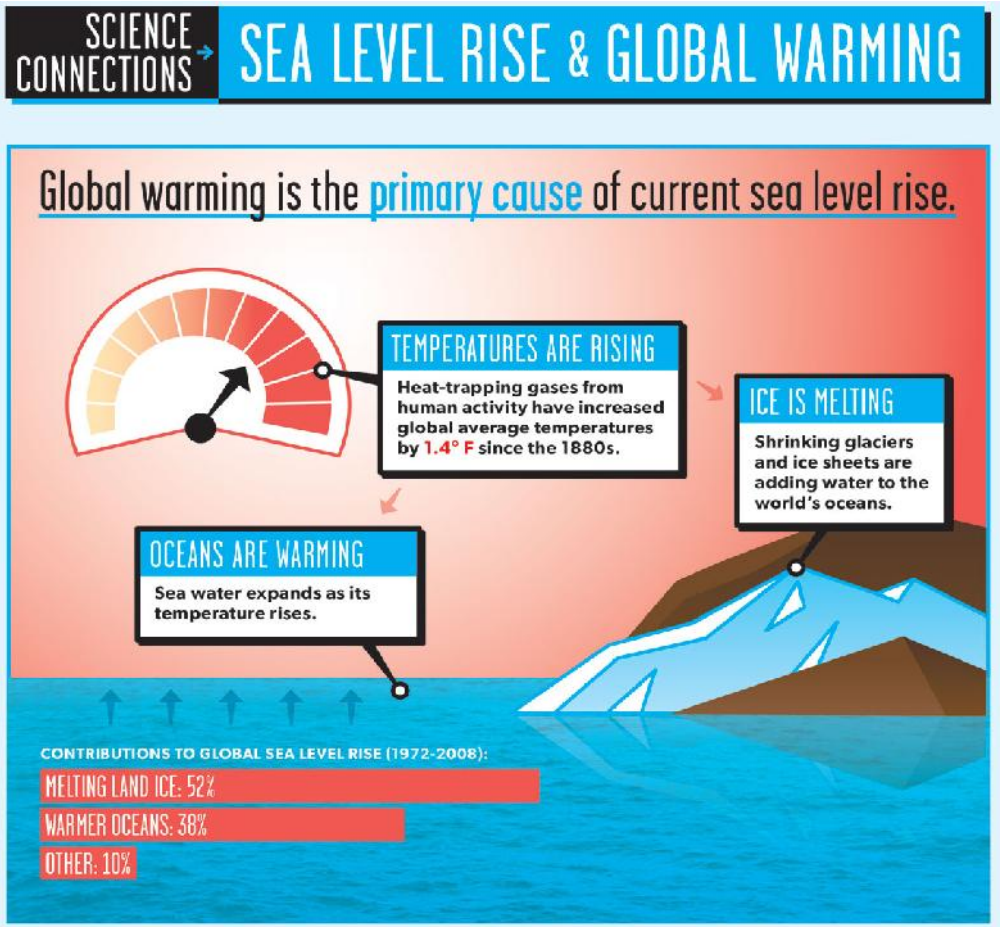
Why have sea levels risen?



The two major causes of global sea-level rise are thermal expansion caused by the

- ***warming of the oceans*** (since water expands as it warms) and
- the ***loss of land-based ice*** (such as glaciers and polar ice caps) due to increased melting.

Impact of SEA LEVEL RISE:

- **Inundation of the coastal area**
- **Shoreline erosion and degradation**
- Salt water intrusion
- Soil erosion
- Population of the coastal area
- Infrastructure
- Tourism ,Impact on health ,Impact on ecosystem

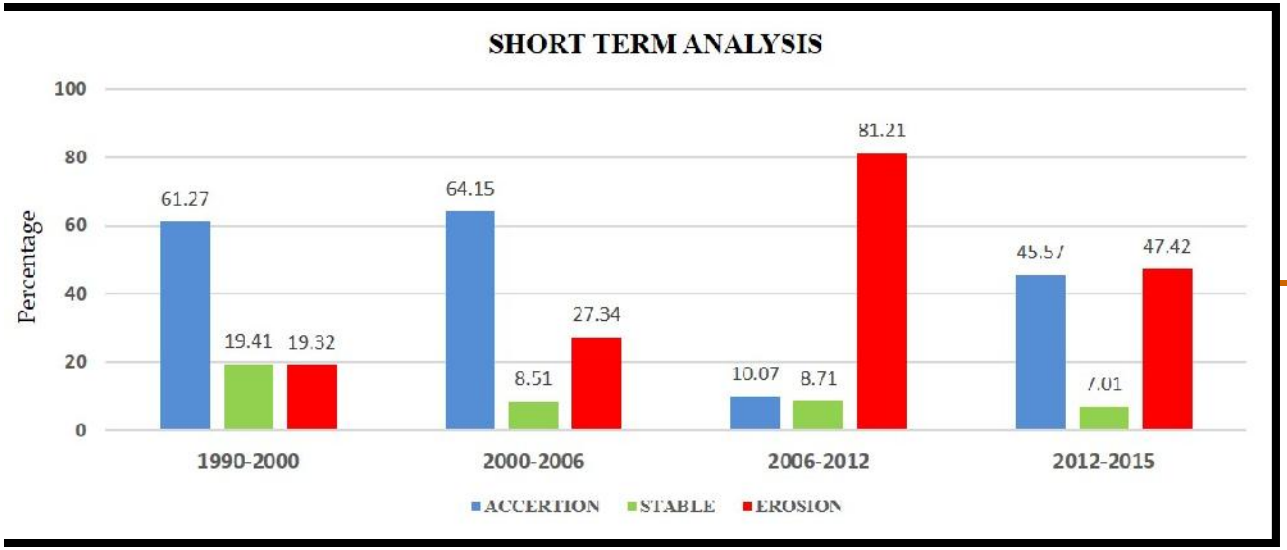
Shoreline erosion and degradation. Rising sea levels allow waves to penetrate further inland, even during calm conditions, increasing the potential for erosion.

Shoreline changes response with Sea level variation

Objective:

- **Shoreline mapping**
- **Inundation Analysis**
- **Impact assessment**

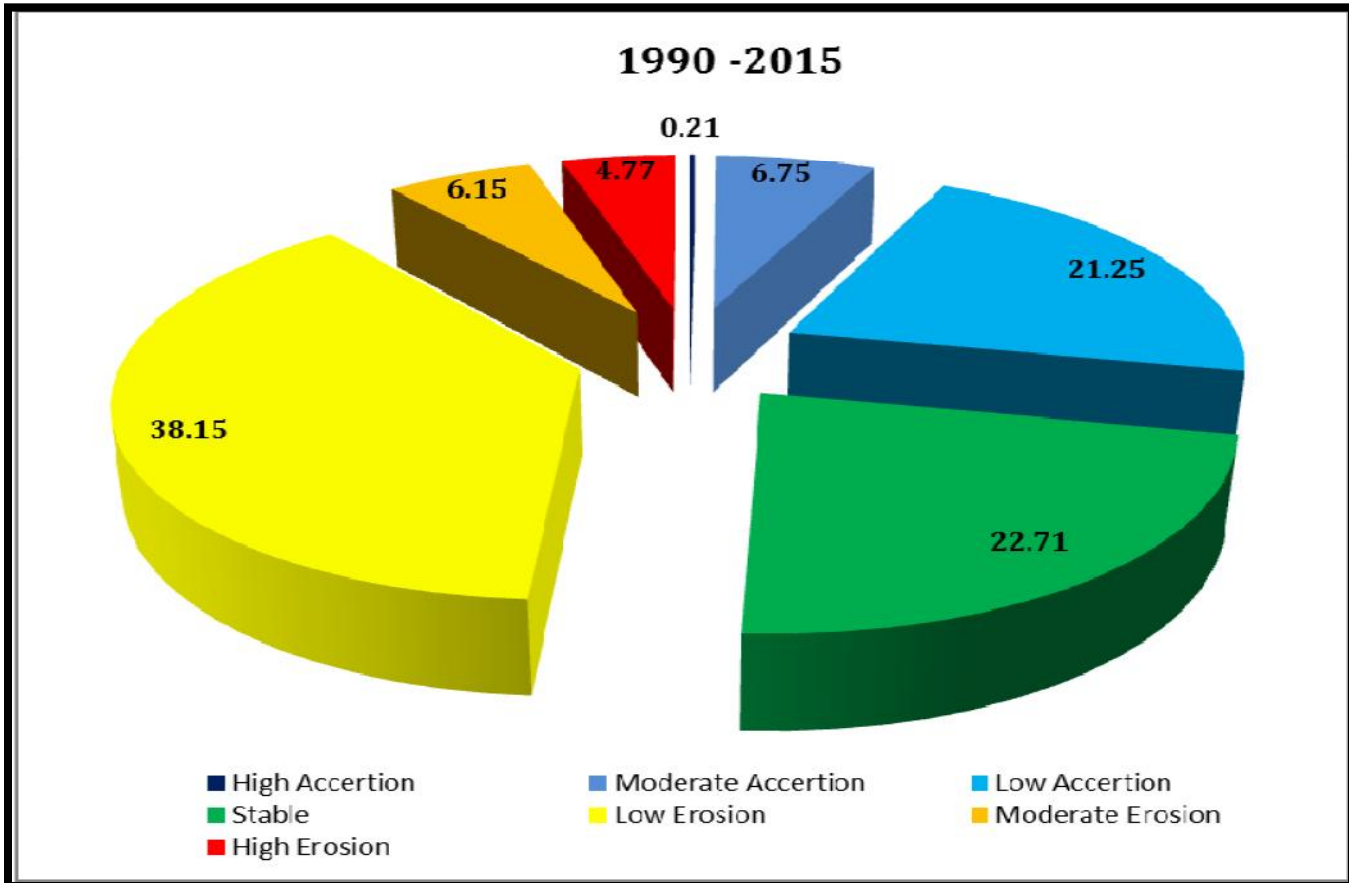
- **Shoreline changes** are carried out using the datasets from 1990-2015. Landsat 5 (1990), Landsat 7 (2000), Cartosat-1 (2006), Resource-sat 1 (2008), Resource-sat 2 (2012-2015). Shoreline has been extracted and using DSAS tool in ArcGIS both long term and shore term were analyzed.
- Low lying coastal land of Study areas which are affected by inundation and projected sea-level rise (SLR) over 100 years has been identified. The datasets required for this approach are Shoreline Change and Bathymetry of study area. Using **Bruun rule and Modified Bruun rule**, the inundation map was prepared.
- By overlying thematic maps (Landuse/ Landcover and Geomorphology) and inundation output, the **impact assessments** were analyzed using the geo-techniques.



ESSO

Processing:

- Satellite data collection
- GCP collection
- Rectification
- Quality Check
- Shoreline extraction
- DASA tool (shoreline change analysis- STA, LTA)



Bruun Rule VS Modified Bruun rule

Impact of SEA LEVEL RISE

BRUUN RULE

PARAMETERS

Length

Depth

Height

$$L_1 = \left(\frac{l}{h+d}\right) a$$

MODIFIED BRUUN RULE

PARAMETERS

Historic , Future retreat rate

Historic, Future SLR

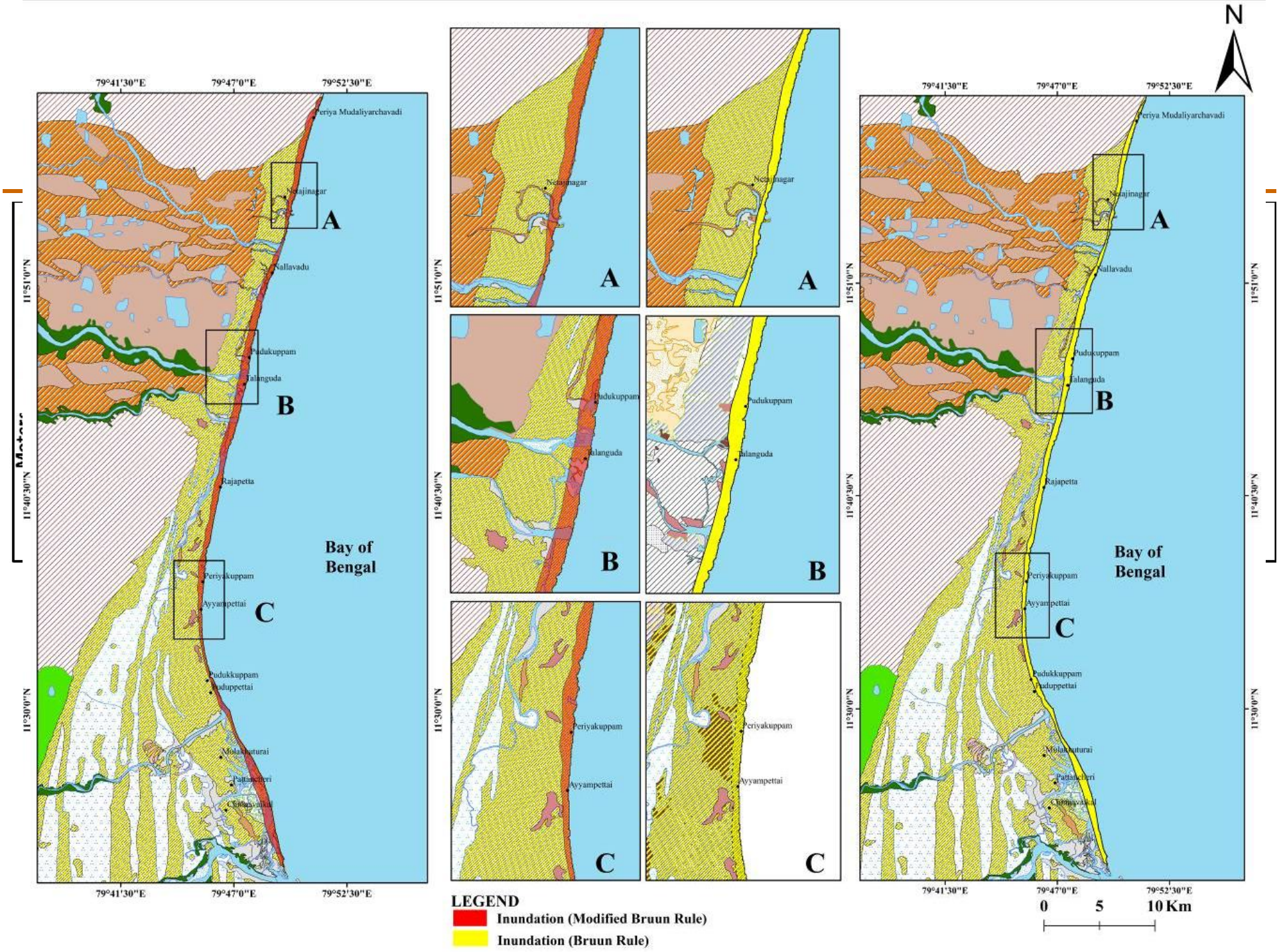
depth of closure

Length of active cross shore profile.

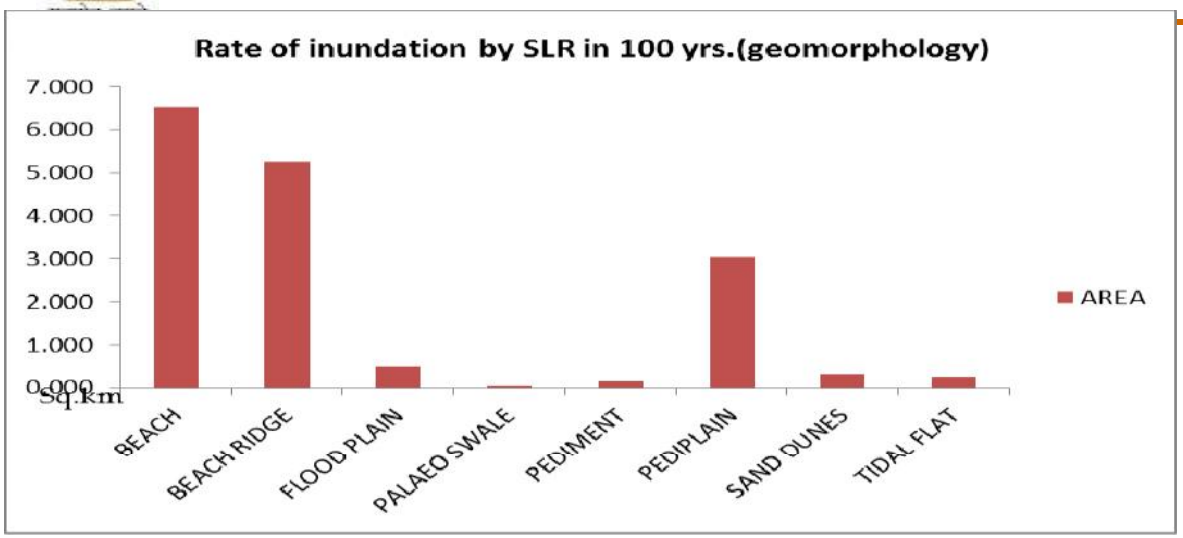
Dune Elevation

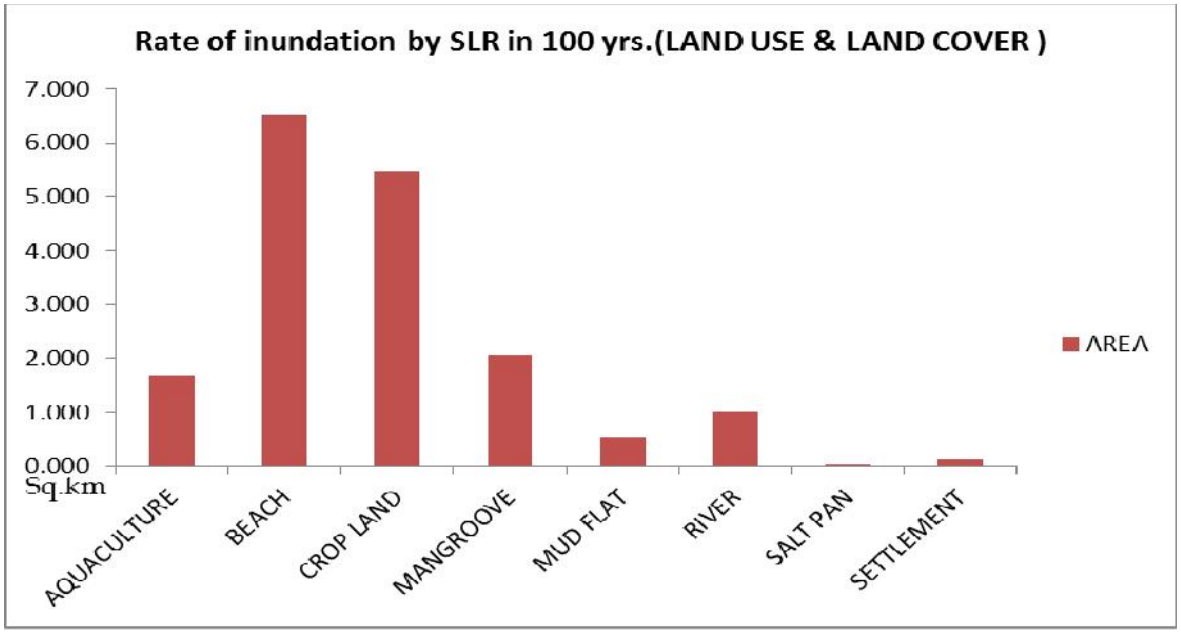
Proportion of Sediment transportation

$$R_2 = R_1 + \frac{(S_2 - S_1)L}{P(B+h)}$$


N
79°41'30"E
79°47'0"E
79°52'30"E
11°15'0"N
11°30'0"N
Periya Mudaliyarchavadi
Netajinagar
Nallavadu
Pudukuppam
Talanguda
Rajapetta
Periyakuppam
Ayyampettai
Pudukkuppam
Puduppettai
Molakkuturai
Pattanchcheri
Chinnavankal
A
B
C
Bay of Bengal
LEGEND
Inundation (Modified Bruun Rule)
Inundation (Bruun Rule)
0 5 10 Km

RESULT





- The attempt gives an initial warning about the shore coast to be persevered.
- Since Bruun rule is not a full pledged rule, the modified Bruun rule has compared to demarcate the coastal disaster. But it acts as a pre-alarm for the future crisis.
- Hence the resultant gives a brief admittance to prevent from the future disaster aimed in the coast.