EVS -G2

* Sea-level rise due to climate change is a significant concern for Gujarat, especially for low-lying areas and small islands.
* SST-sea surface temperature.
* Rising sea surface temperature (SST), caused by absorbing excess heat from greenhouse gas emissions, contributes to sea-level rise and coastal erosion.
* The influence of SST, solar activity (sunspots), and galactic cosmic rays (GCR) on sea-level rise in Gujarat using Landsat data.
* Coastal Vulnerability Index (CVI) used to assess coast vulnerability to future sea-level rise.
* Gujarat's high to very high-risk areas include the north-western parts of the Gulf of Khambhat, northernmost parts of the Gulf of Kachchh, and western parts of the Kachchh coast.
* SST and upper ocean heat content in the tropical Indian Ocean experienced rapid warming from 1950 to 2015, with an average increase of about 1°C.
* This warming trend is expected to continue in the future under different emission scenarios, with projections suggesting a rise of 1.2–1.6°C in SST by 2040 to 2069.
* The Indian Ocean has been warming faster than tropical oceans over the last two decades, contributing significantly to the increase in global oceanic heat content.
* Various studies have explored the relationship between solar activity and surface temperature, rainfall, sea level pressure, SST, and upper ocean temperature.
* The 11-year cycle in sunspot numbers, indicative of changes in solar radiation, is used as an indicator of solar activity variations.
* Analysis of SST data over 150 years showed a robust signal of warming during solar max and cooling during solar min, with high statistical significance.
* **Shoreline Changes near Mahi Estuarine Belt**
* Researchers used Landsat data from 1978 to 2018 to study shoreline changes near the Mahi estuarine belt in the Gulf of Khambhat region.
* Results showed continuous shoreline migration towards the land area over 40 years, with a total migration of 1590.5 meters.
* The annual rate of change was alarmingly high at 39.76 meters per year, indicating severe erosion that could lead to future disasters for coastal villages