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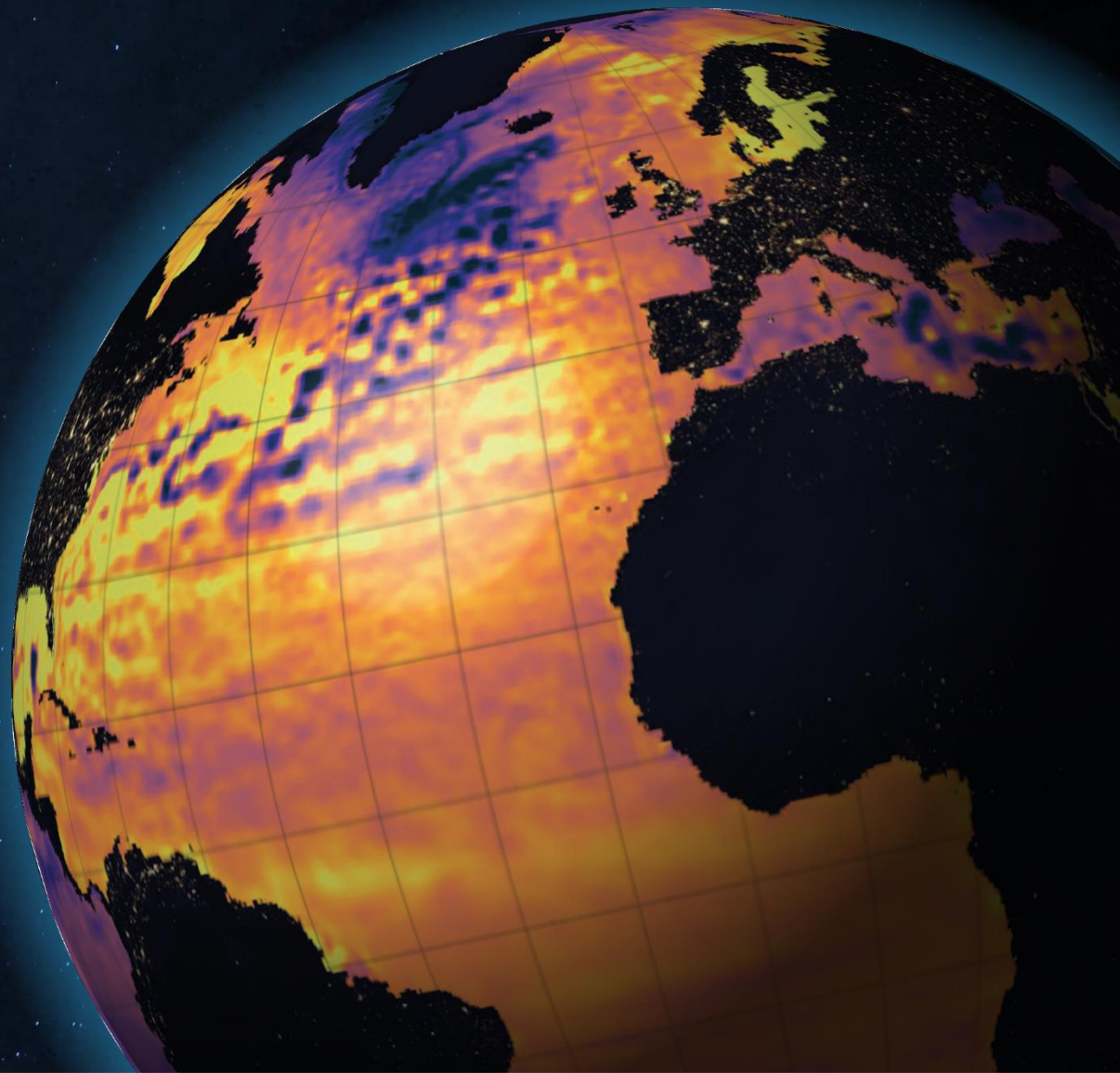
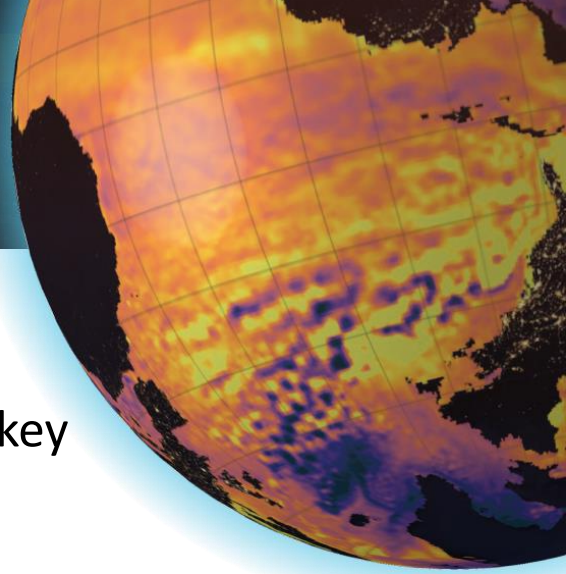
2021 2030 United Nations Decade of Ocean Science for Sustainable Development

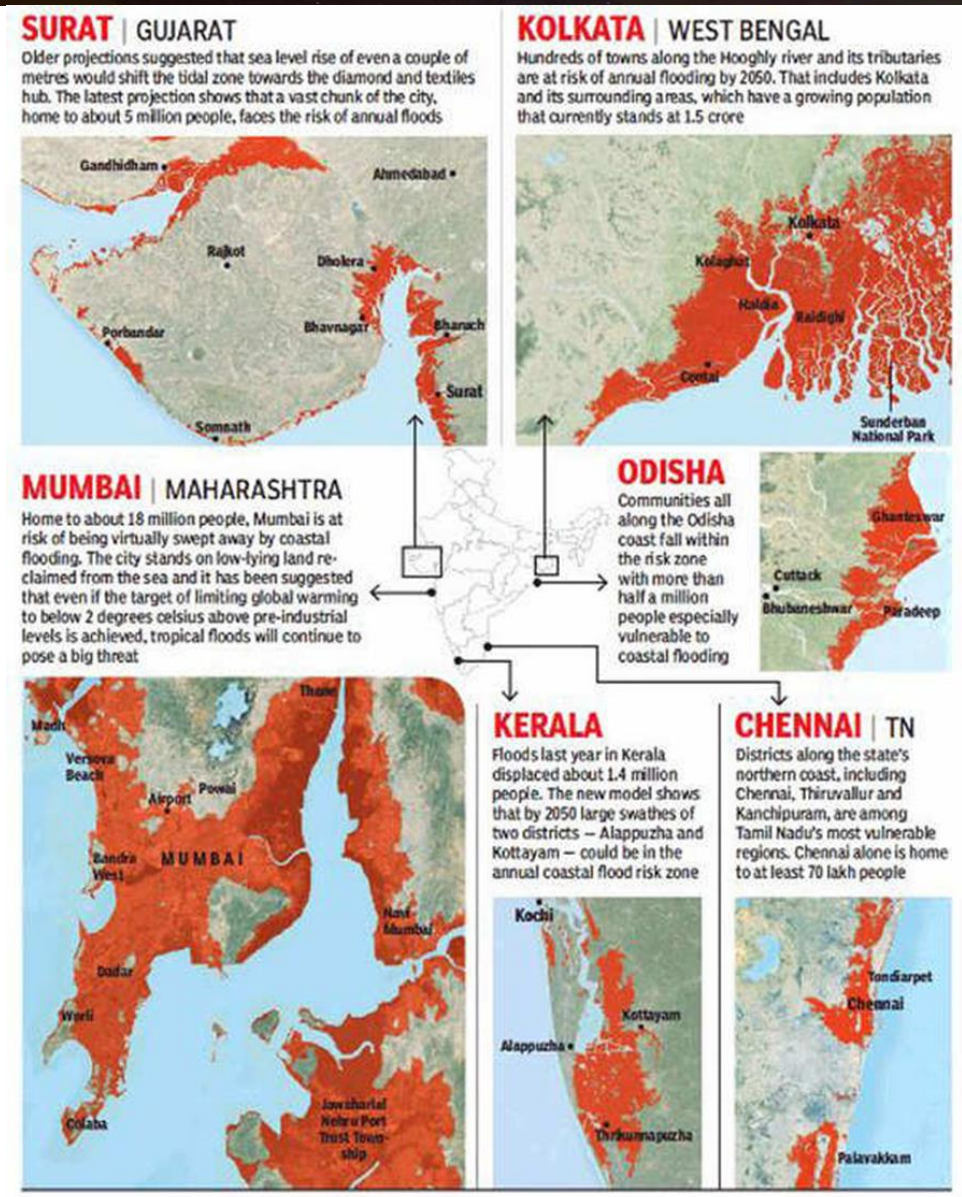
Sea Level Rise Projections for the Tamil Nadu Coast: An Analysis of Present and Future Trends

Vivek Ganesh, Santonu Goswami and Harini Nagendra

School of Climate Change and Sustainability
Azim Premji University, Bengaluru, India







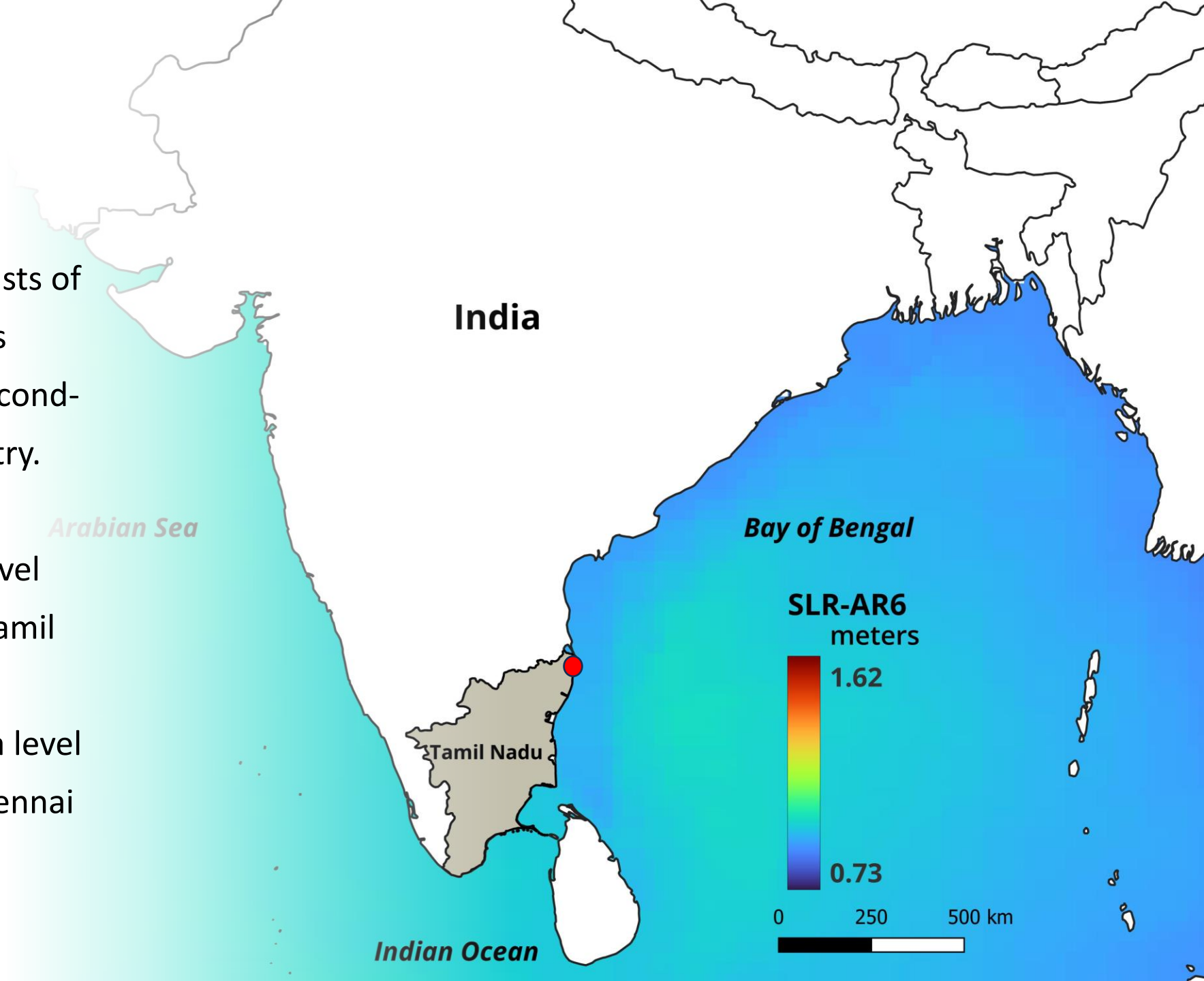
Introduction

- Variations in global mean sea level are a key indicator of global climate change.
- Measuring sea level provides critical information on its impact on coastal populations and land use.
- Satellite-based measurements are essential for determining if sea levels are rising and for assessing the vulnerability of coastlines to this increase.
- Altimeter measurements, available globally, enable the identification of sea level trends in specific regions.

Source: TOI, 2019; 7-fold surge in Indians at risk due to sea level

Study Area and Objectives

- This study focuses on the coasts of Tamil Nadu (TN) which covers about 1,076 km and is the second-longest coastline in the country.
- **Objectives of this study:**
  - To analyze current sea level rise patterns along the Tamil Nadu coast
  - To understand future sea level rise scenarios for the Chennai



Data

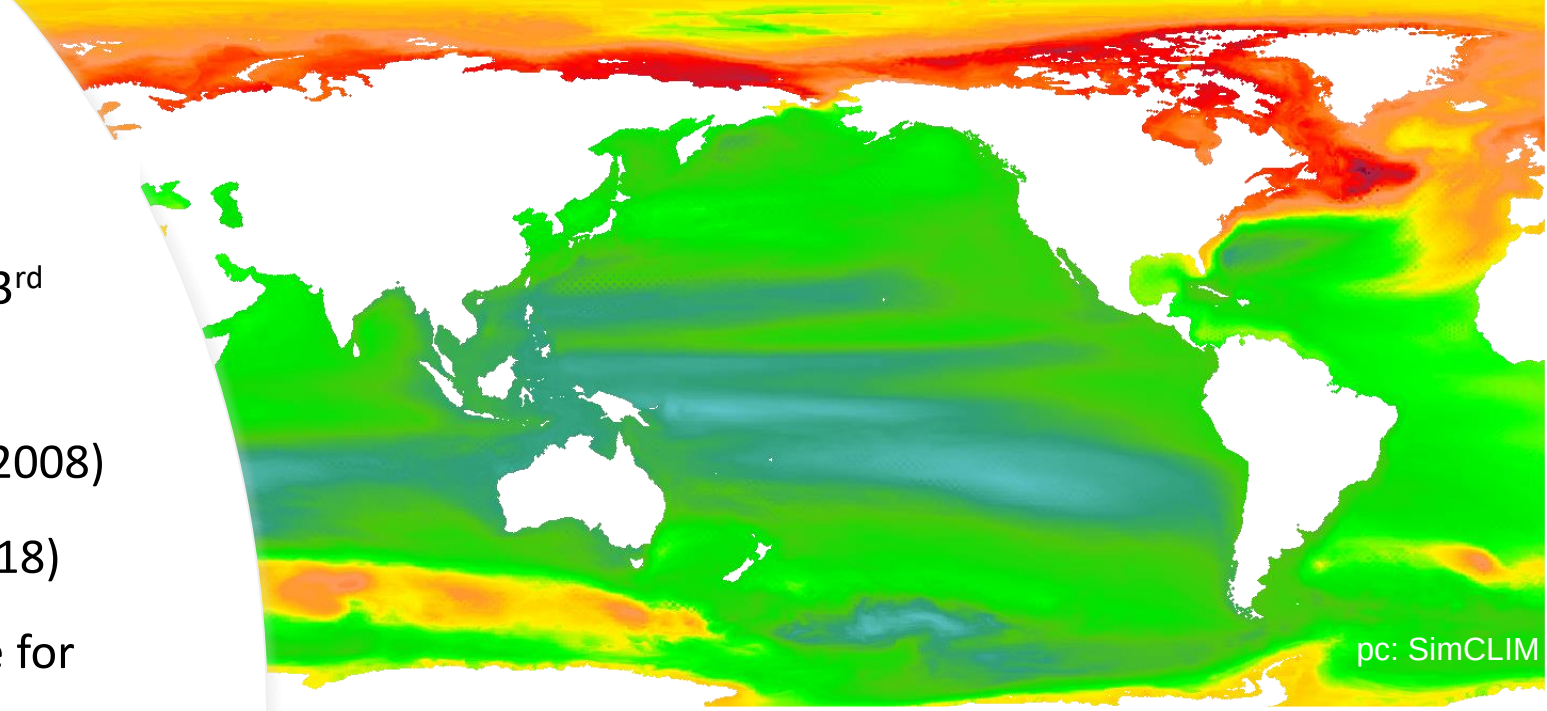
1. Altimeter Data

- ***TOPEX/ POSEDION*** (1st January 1993 TO 23rd April 2002)
- ***JASON-1*** (24th April 2002 TO 18th October 2008)
- ***OSTM/JASON-2*** (July 2008 TO October 2018)

2. Tide gauge data from the Permanent Service for Mean Sea Level (PSMSL)

3. Projected Data

- **SimClim AR6** is a stand-alone modelling system that can be customised to examine risks from, and adaptations to current climate variables and future climate change.
- SLR Site specific scenario generator for SSP2-4.5 & 5-8.5.

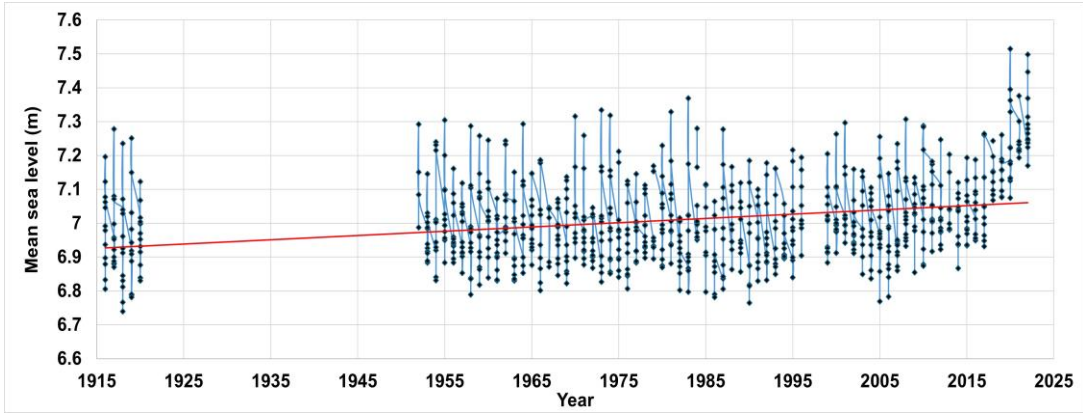


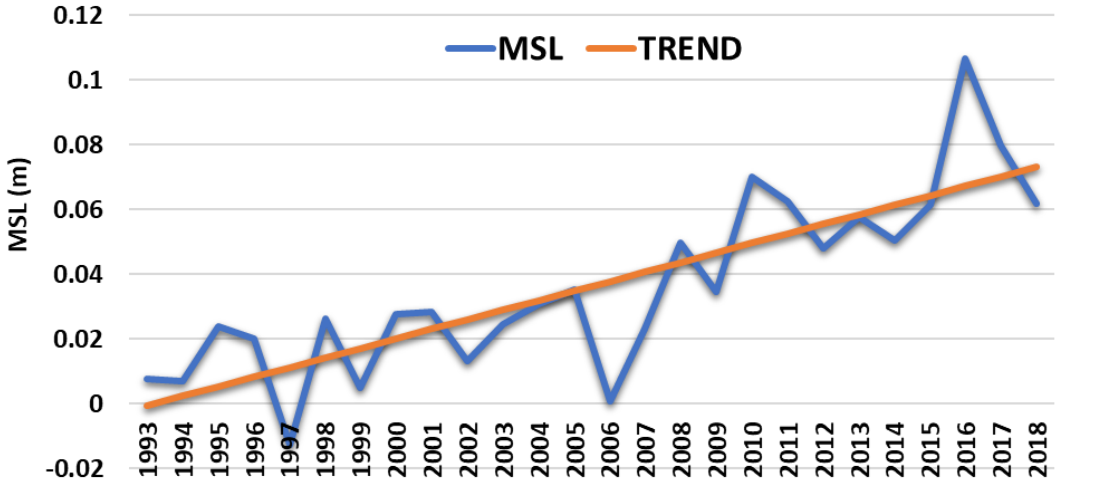
Observations…

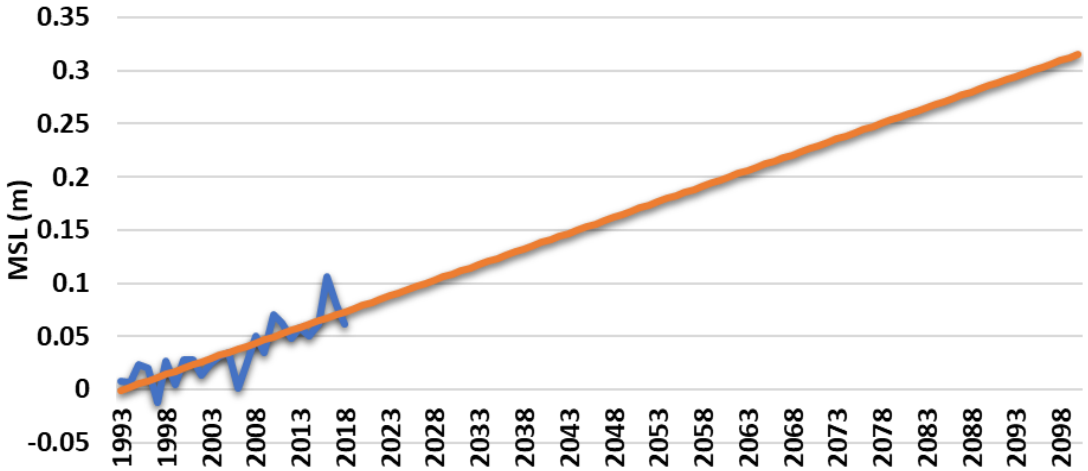
- ***NOAA tides & currents*** **-** it indicates a relative sea level rise trend of **0.55 mm per year** with a 95% confidence interval of +/- 0.34 mm/yr based on PSMSL data obtained for Chennai tide gauge (1916-2015)

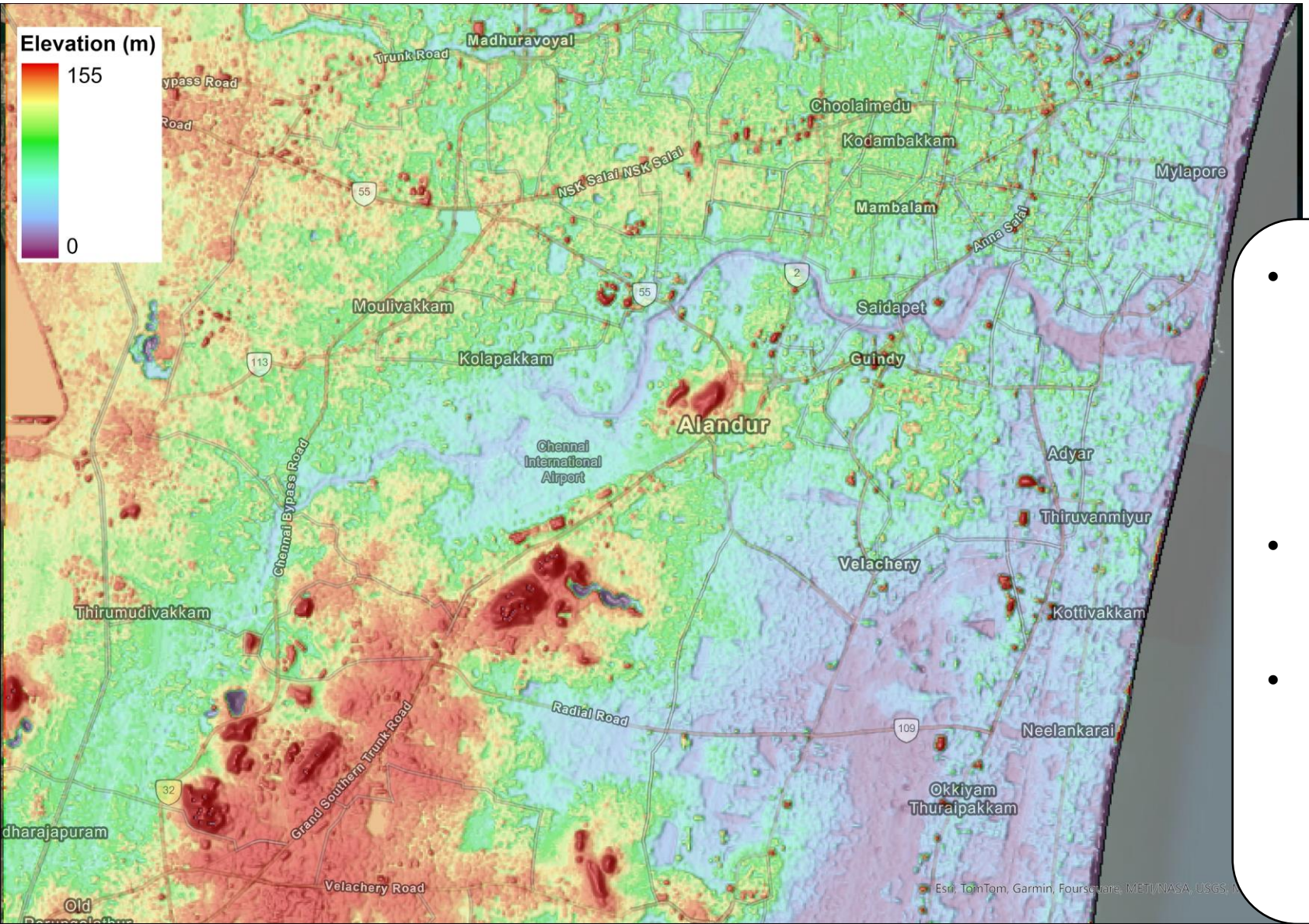
- Based on altimeter data, we found that sea level had risen by **0.07m up to 2018** along TN coast.

- Future projections estimate that mean sea level along the Tamil Nadu coast will rise by **0.15 m by 2050** and by **0.3m by 2100**.









Chennai

- Situated on a flat coastal plain known as the Eastern Coastal Plains. Its average elevation is approximately 6.7 meters (22 feet) above sea level.
- Rapid population and urbanization growth.
- This low elevation, combined with its proximity to the coast, makes Chennai particularly vulnerable to sea level rise and flooding

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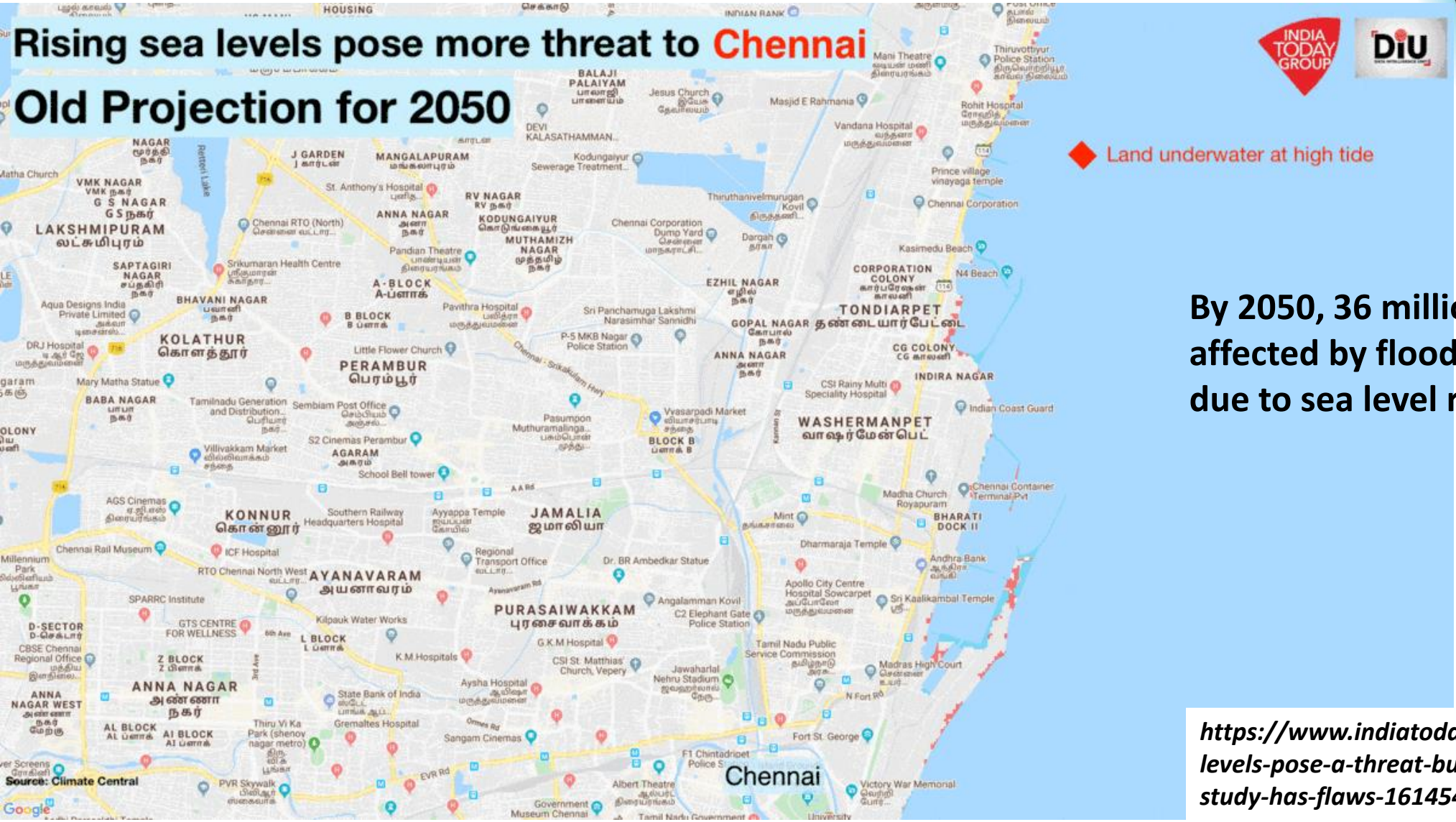
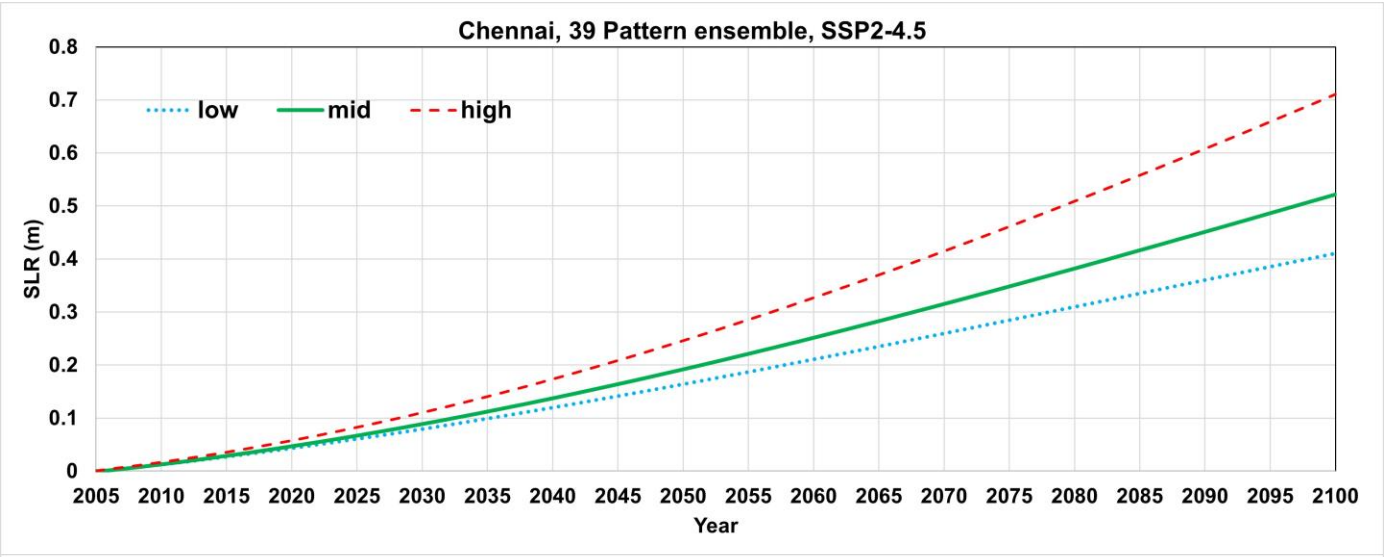
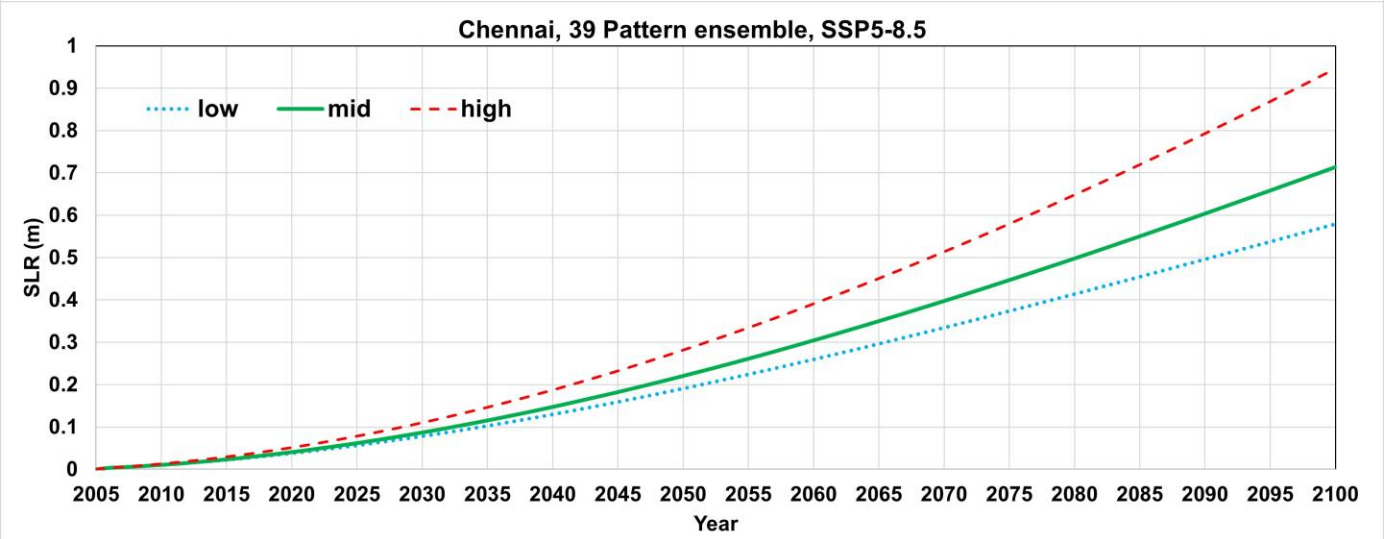


By 2050, 36 million Indians may be at affected by flooding and inundation due to sea level rise.

https://www.indiatoday.in/diu/story/rising-sea-levels-pose-a-threat-but-indian-scientist-says-the-study-has-flaws-1614544-2019-10-31

Future Sea level rise for Chennai

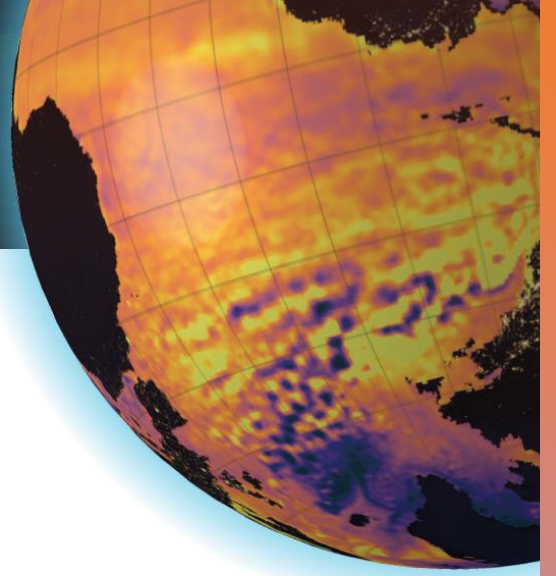




Year	2050			2100		
Scenario	low	mid	high	low	mid	high
SSP2-4.5	0.16	0.19	0.24	0.19	0.22	0.28
SSP5-8.5	0.41	0.52	0.71	0.57	0.71	0.94

in meters

- Sea level rise projections were derived using SimCLIM AR6 data, incorporating a vertical land movement rate of **2.250 mm/year** to account for local subsidence effects in Chennai. https://slr-cities.climsystems.com/#13.10,80.33
- **Under SSP2-4.5 scenario**, projected sea level rise for Chennai ranges from 0.16 m to 0.24 m by 2050, and from 0.19 m to 0.28 m by 2100, showing moderate increases.
- While, **Under SSP5-8.5 scenario**, sea level rise could reach up to 0.71 m by 2050 and 0.94 m by 2100, highlighting the risks associated with high-emission pathways.



What should be the next step…..

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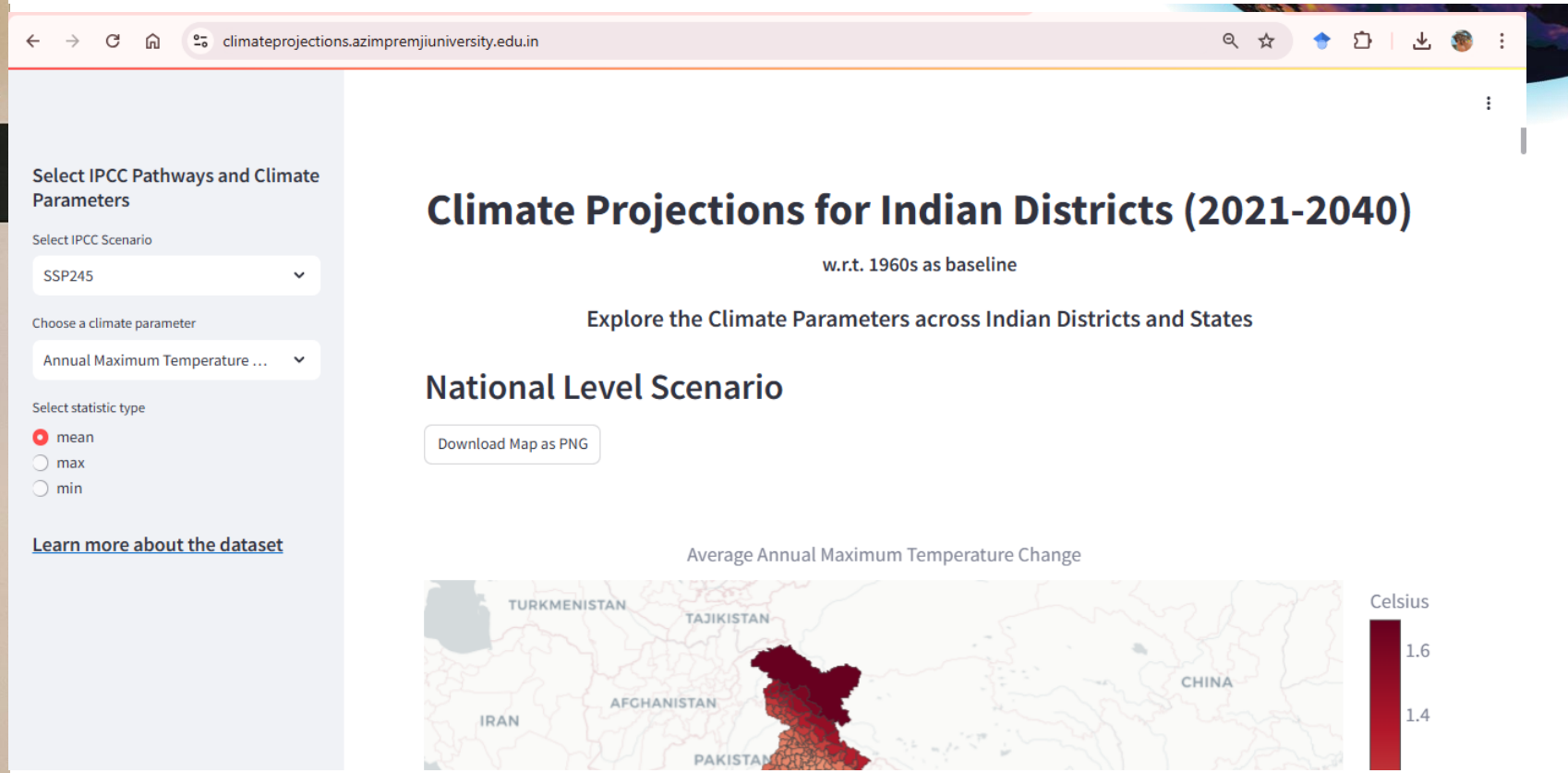
Navigating India's Climate Future

https://azimpremjiuniversity.edu.in/navigating-indias-climate-future



Let's connect and collaborate – vivek.g@apu.edu.in

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Nature is neither created by nor dependent on human beings, so it can survive even without the existence of human beings. Nature has its own universe and governed by its own laws and also self-sustains itself by its own well-ordered process.

- K.S.

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