

Satellite observations and modeling of earthquake hazards in South and Southeast Asia

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Summary

- Satellite radar imagery is used to monitor ground deformation over time.
- We found several areas sinking and rising in Bangladesh and India.
- Our models suggest our observed ground deformation is likely due to ground compression rather than faults.

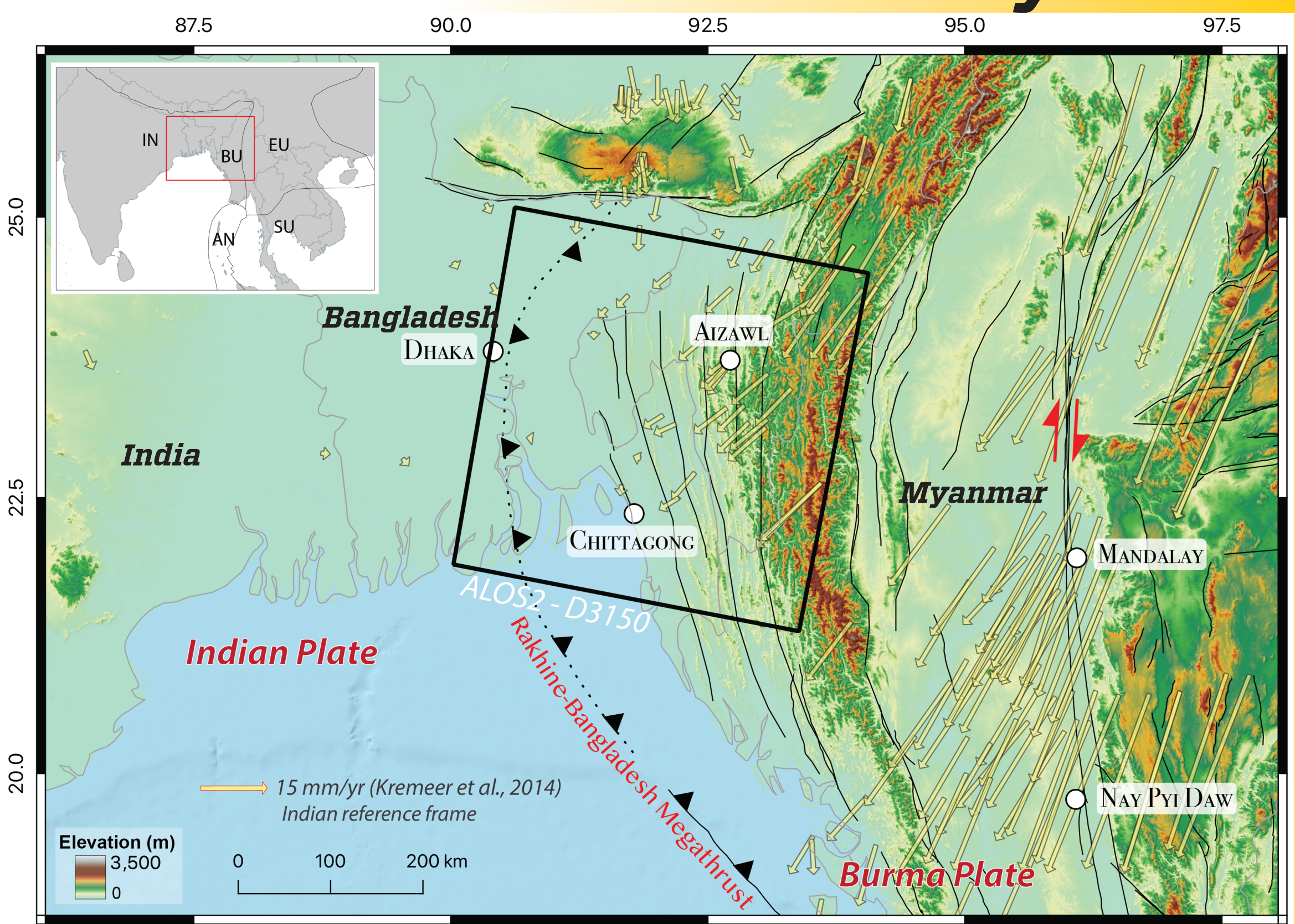
What?

- Earthquake hazard is not well understood in Eastern India, Bangladesh and Myanmar
- This subduction zone (Rakhine-Bangladesh megathrust) is home to 250 million people.
- Earthquakes as large as magnitude 8 can be produced here (1960 M9.5 in Chile is the largest earthquake recorded).

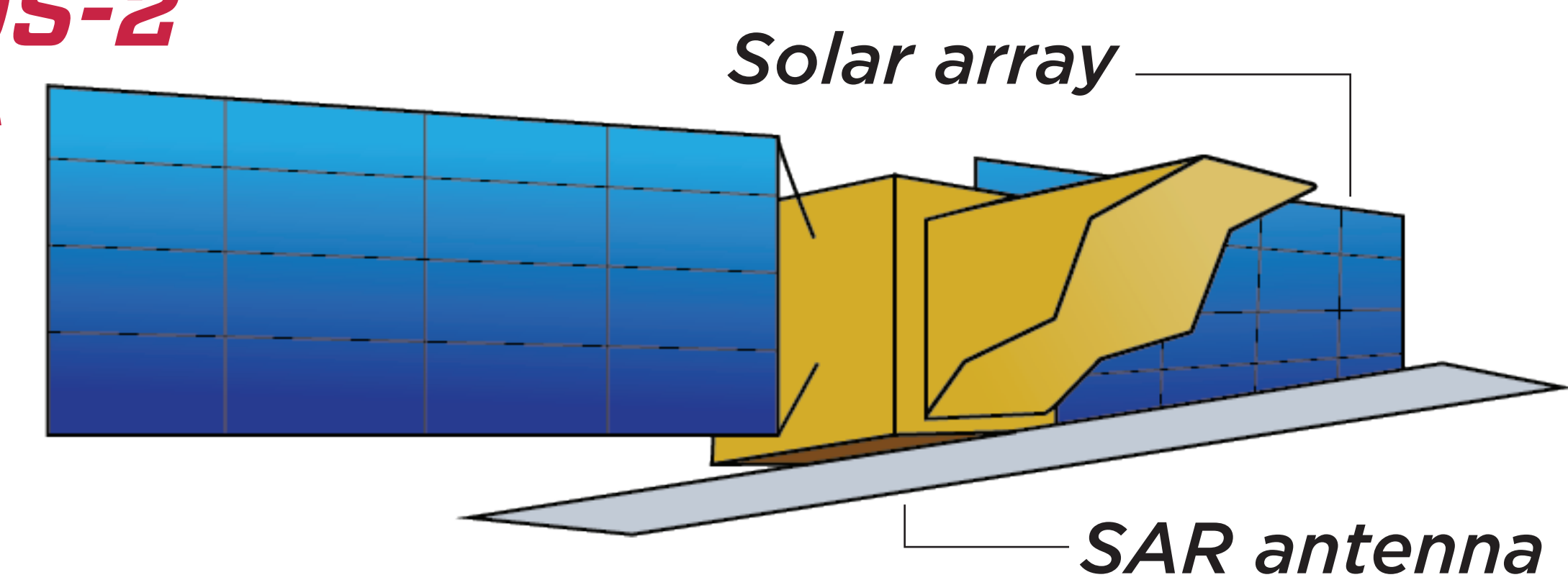
Why?

- This is the **only subduction zone** in the world that is accessible on land.
- This region offers an **unique opportunity** for us to **study the fault interactions** between the megathrust and other faults
- We can apply what we learn from here to subduction zones elsewhere.

Study area



ALOS-2
JAXA



How?

Interferometric Synthetic Aperture Radar (InSAR) is a technique that measures the changes between images. We can use InSAR to detect changes of the ground. We used JAXA's ALOS-2 for our data collection.

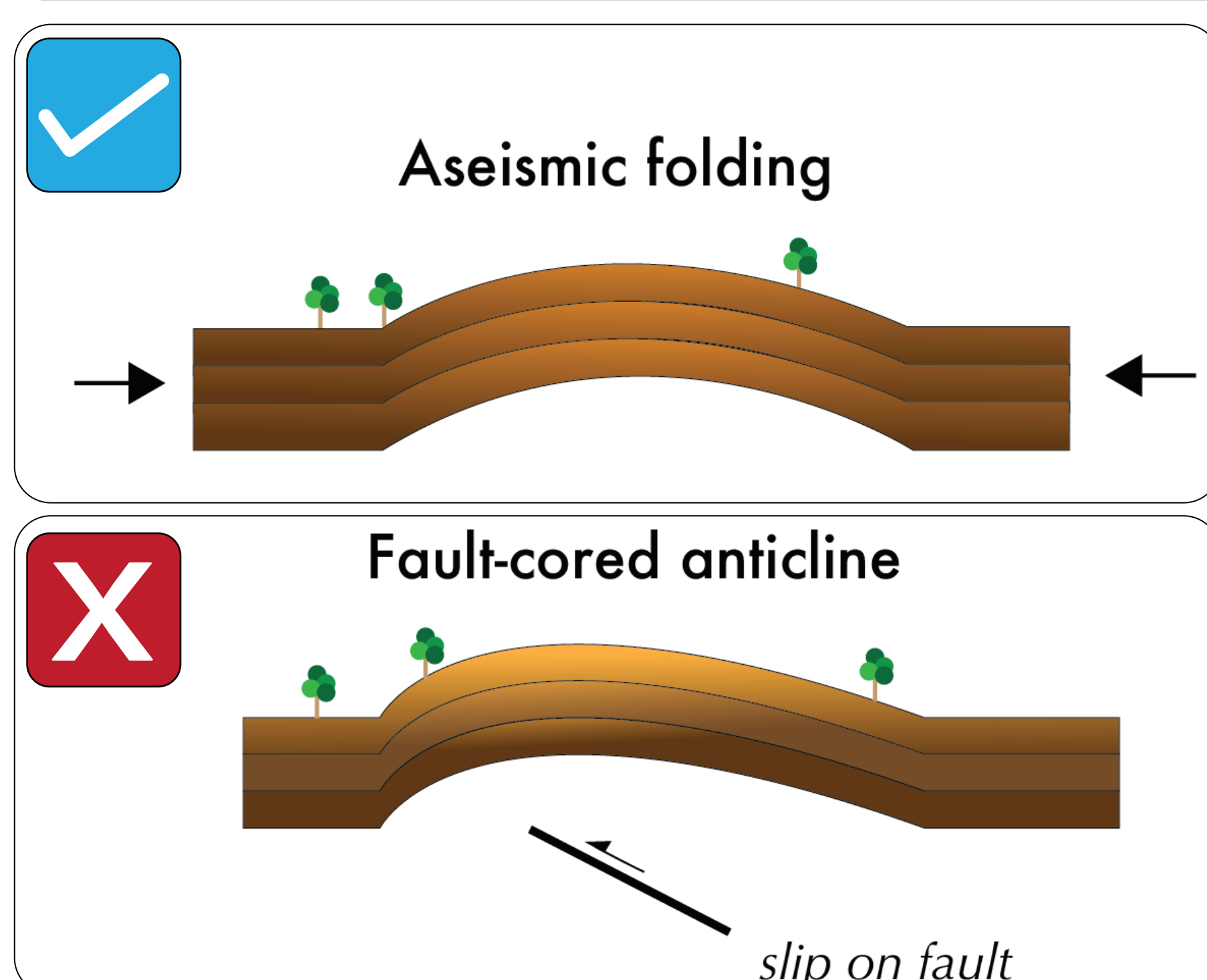
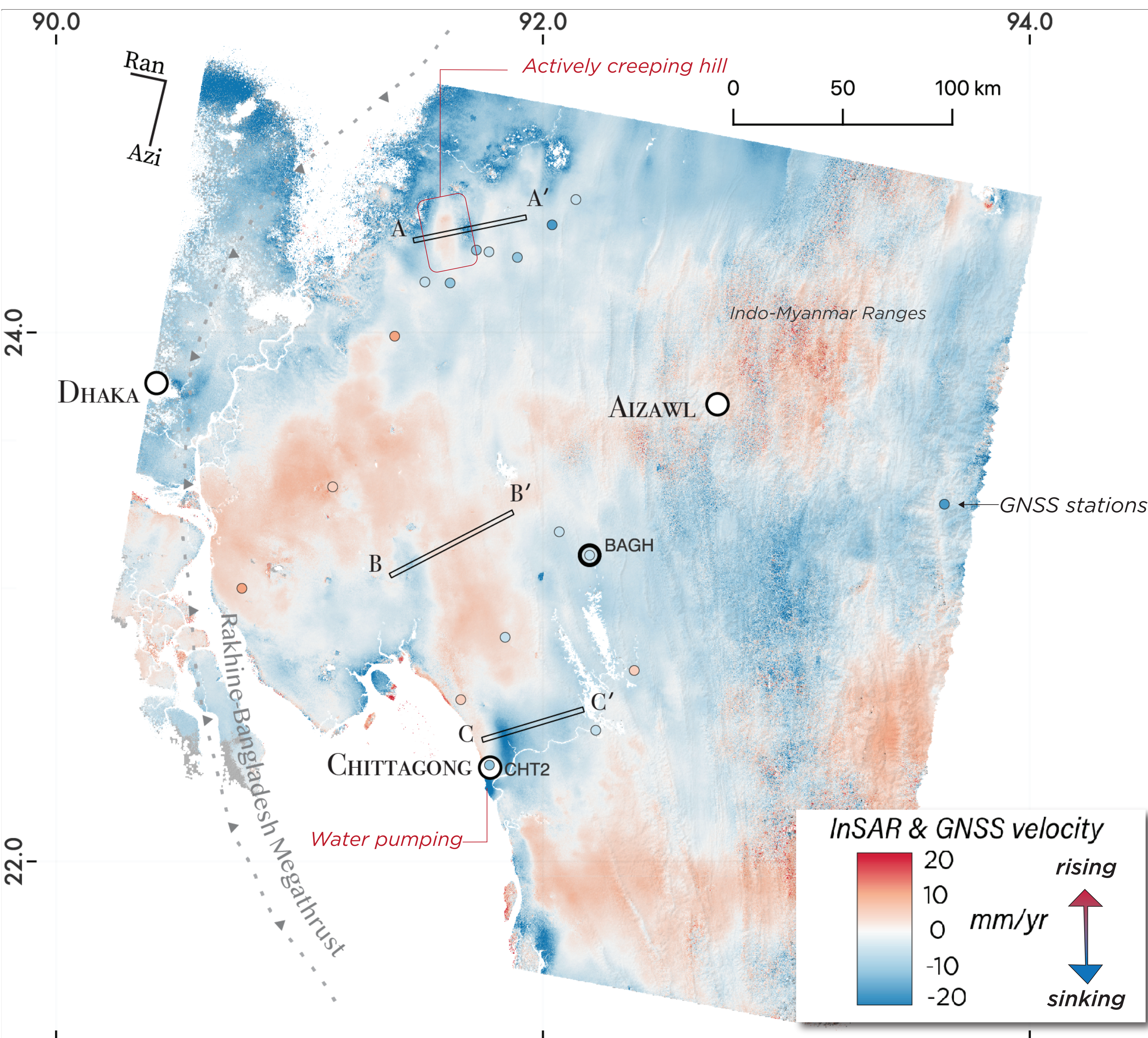
Global Navigation Satellite Systems (GNSS) is an umbrella term for all the different navigational systems (like GPS). We can combine with InSAR to measure how much is the ground moving.

Findings

We identified local ground deformation possibly due to bending of rock layers

- We identified a hill that is actively rising up to 2 mm per year and a city sinking up to 20 mm per year.
- Our models suggest faults are not the best explanation for the signals we observed here.
- We suggest that we are looking into the early stages of fault formation. Where the ground is folding in a ductile manner.

Summary



Interseismic period

