

Geologic Aspects of the M = 8.8 February 27, 2010 Chile Earthquake

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Earthquake

Mw8.8 at a Depth of 35km

Damage Extent

Regional Geology

Uplift / Subsidence

Tsunami



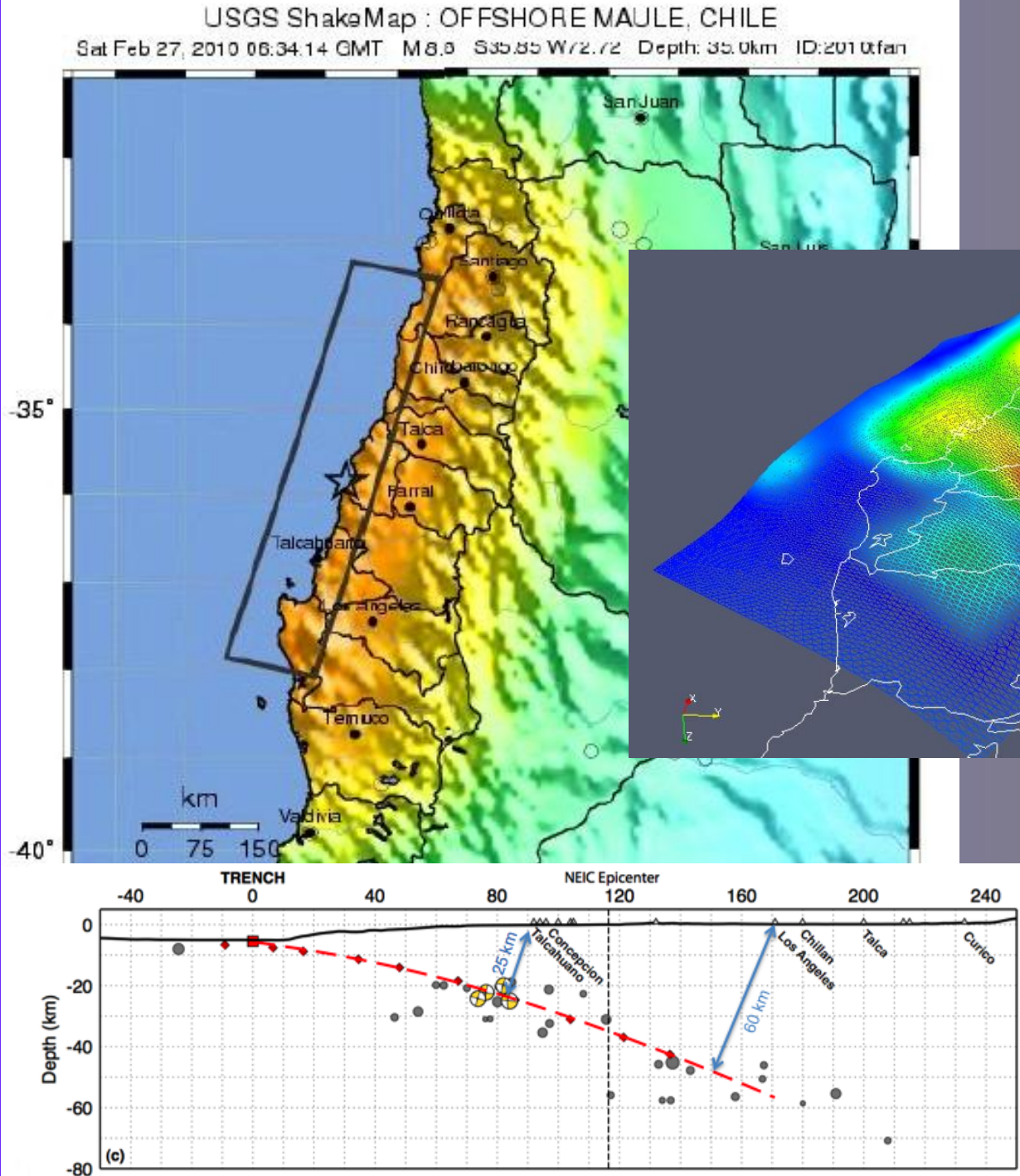
Earthquake

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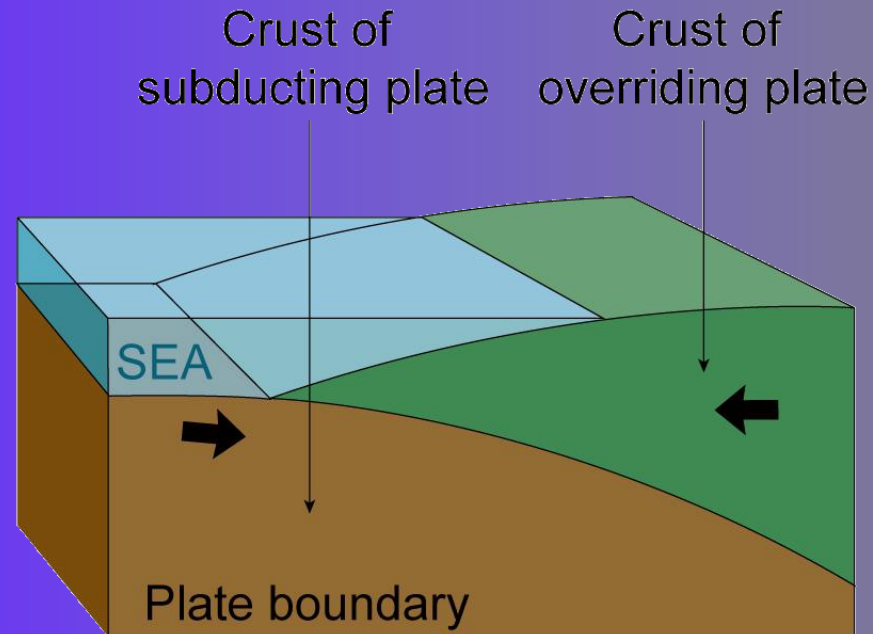
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OVERALL, a tectonic plate descends, or “subducts,” beneath an adjoining plate. But it does so in a stick-slip fashion.

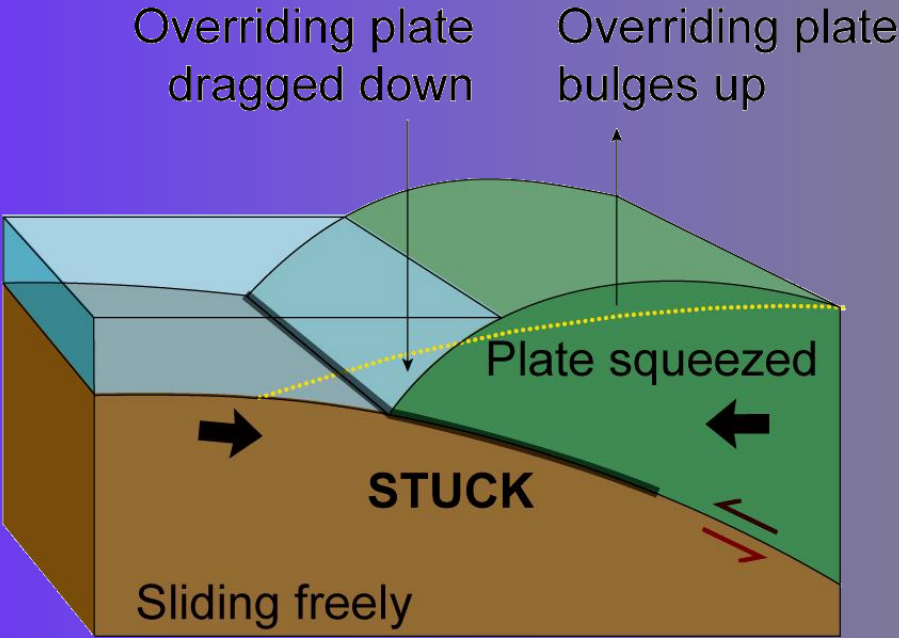
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BETWEEN EARTHQUAKES the plates slide freely at great depth, where hot and ductile. But at shallow depth, where cool and brittle, they stick together. Slowly squeezed, the overriding plate thickens.

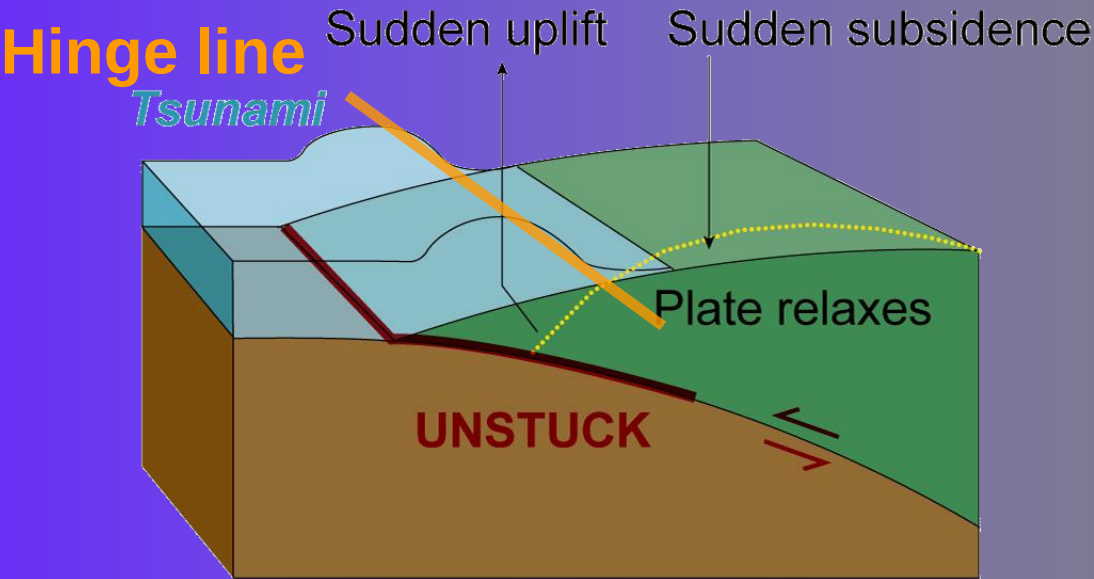
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DURING AN EARTHQUAKE the leading edge of the overriding plate breaks free, springing seaward and upward. Behind, the plate stretches; its surface fails. The vertical displacements set off a tsunami.

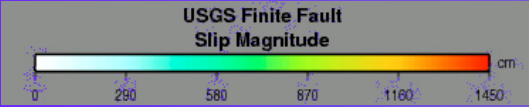
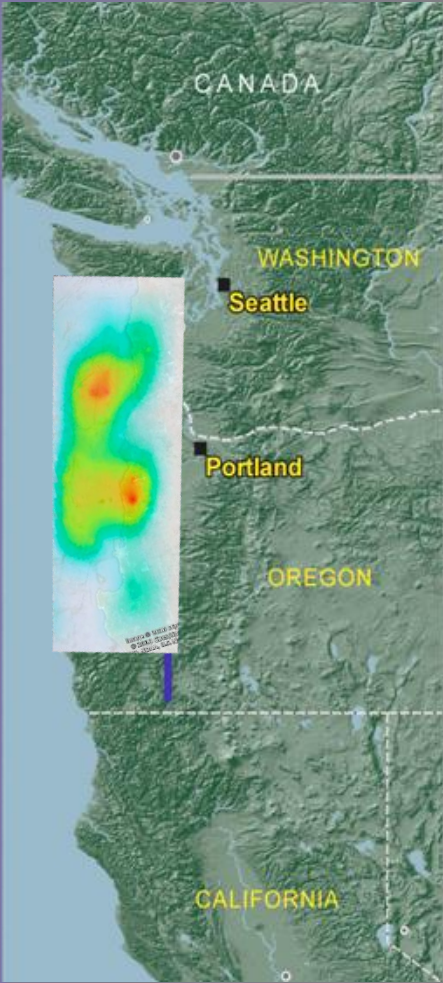
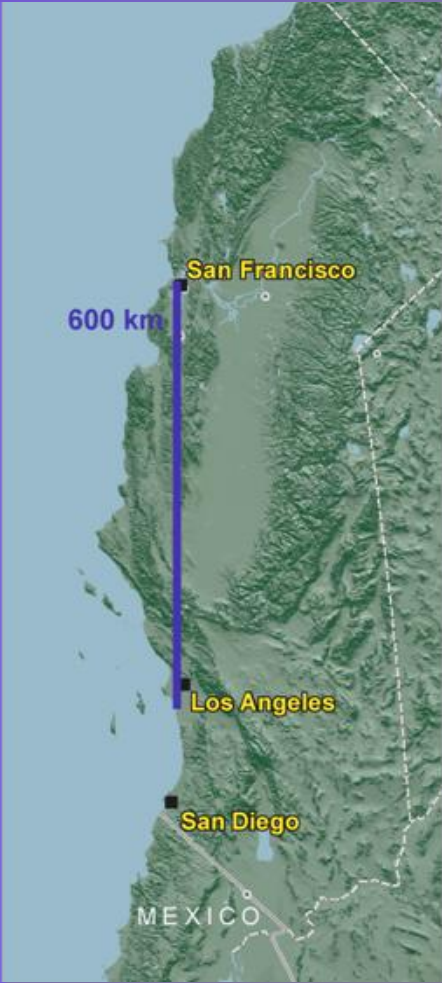
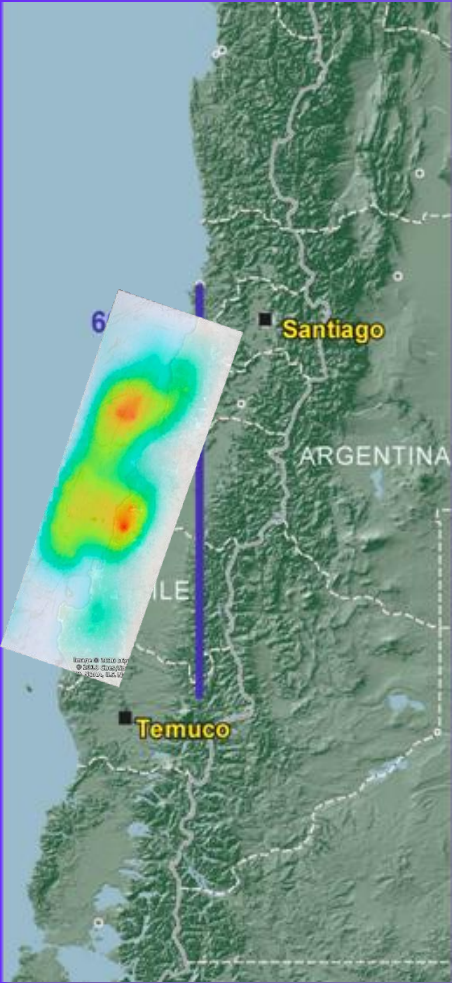
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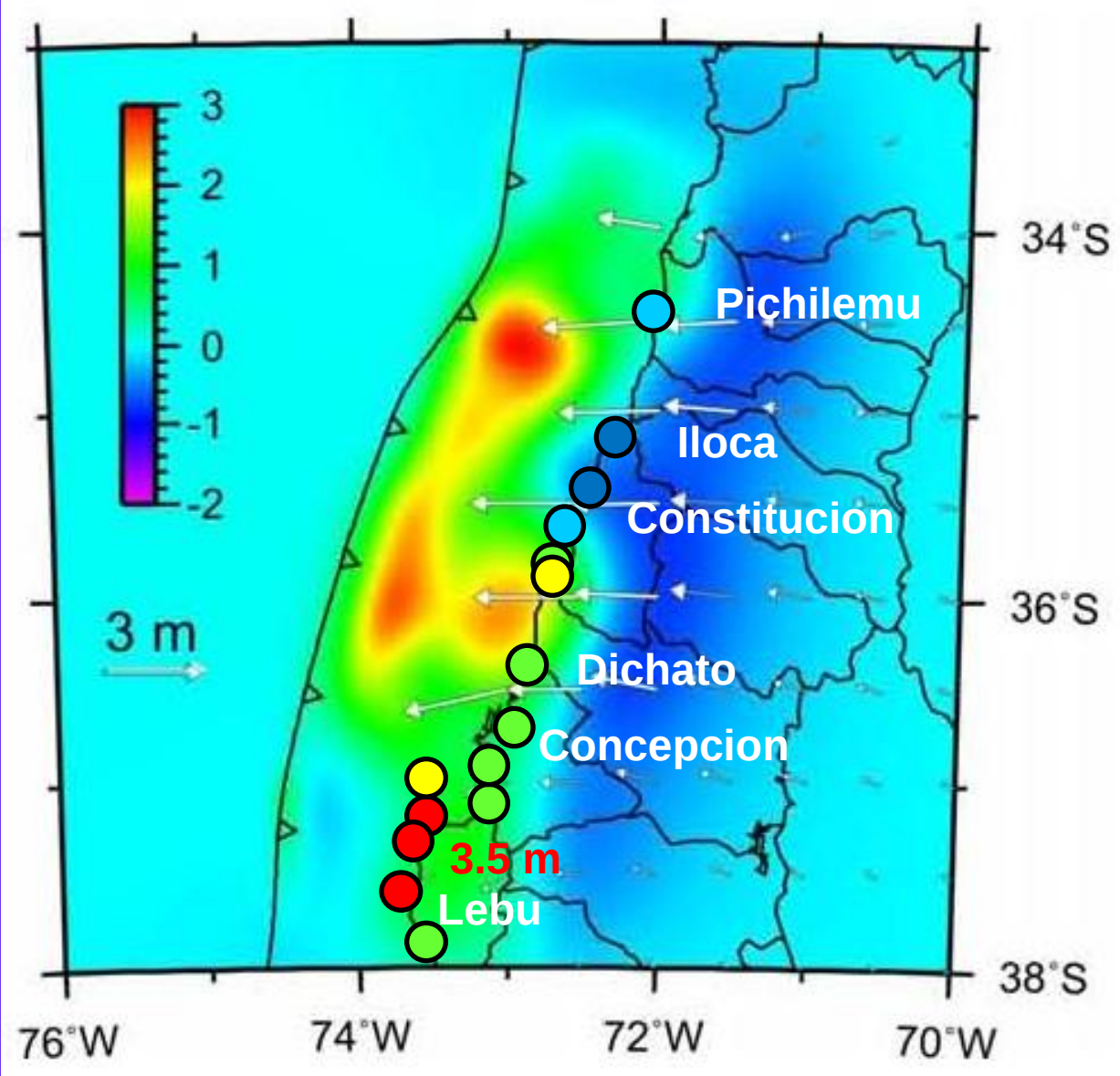
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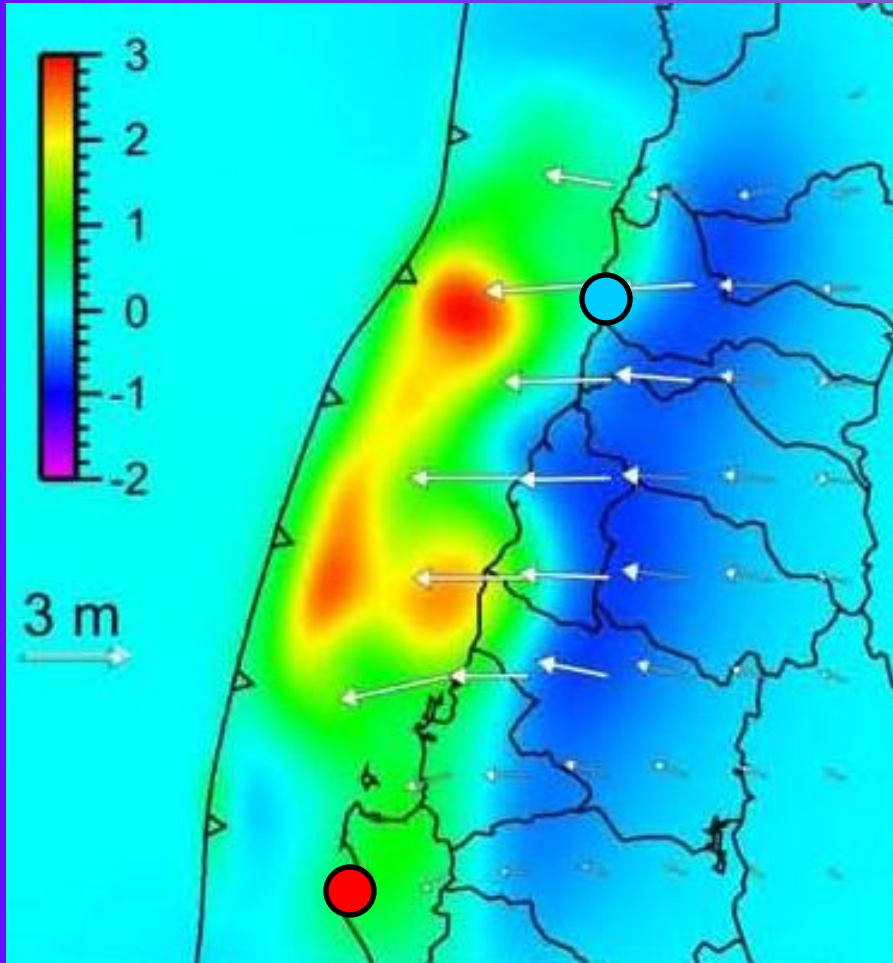
Tsunami

Estimated Coseismic Vertical Displacements



Tectonic Uplift and Subsidence

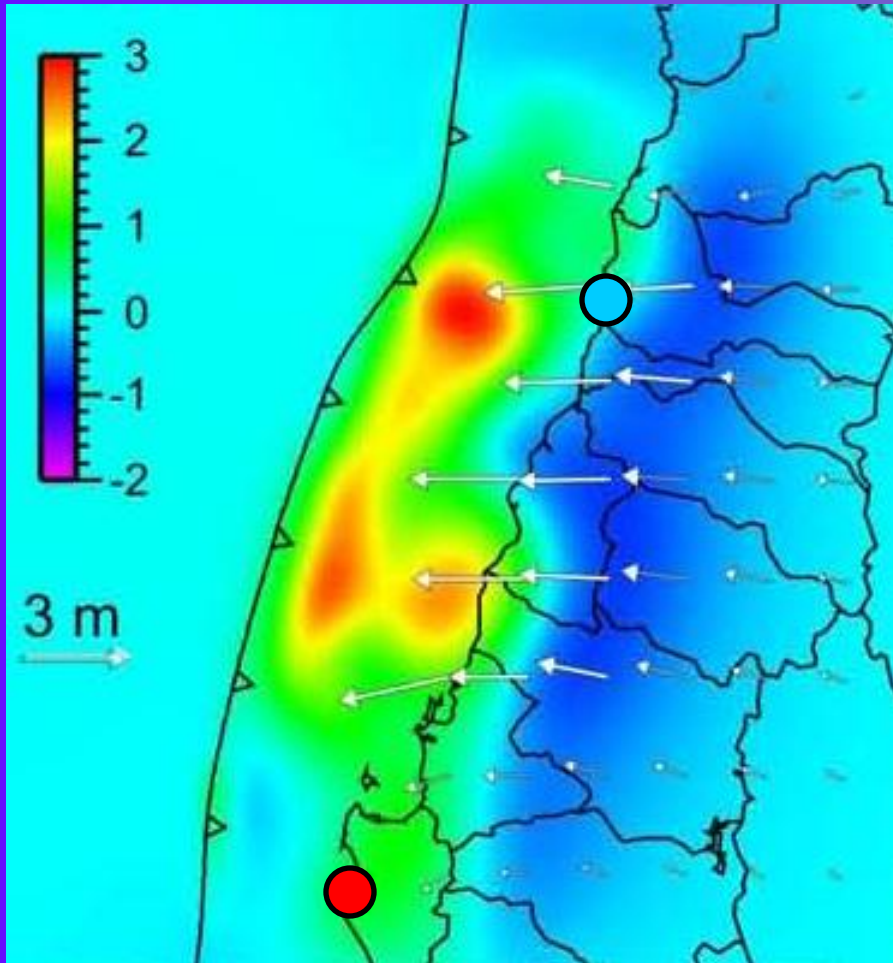
Pichilemu



Arauco Peninsula

2.5 m

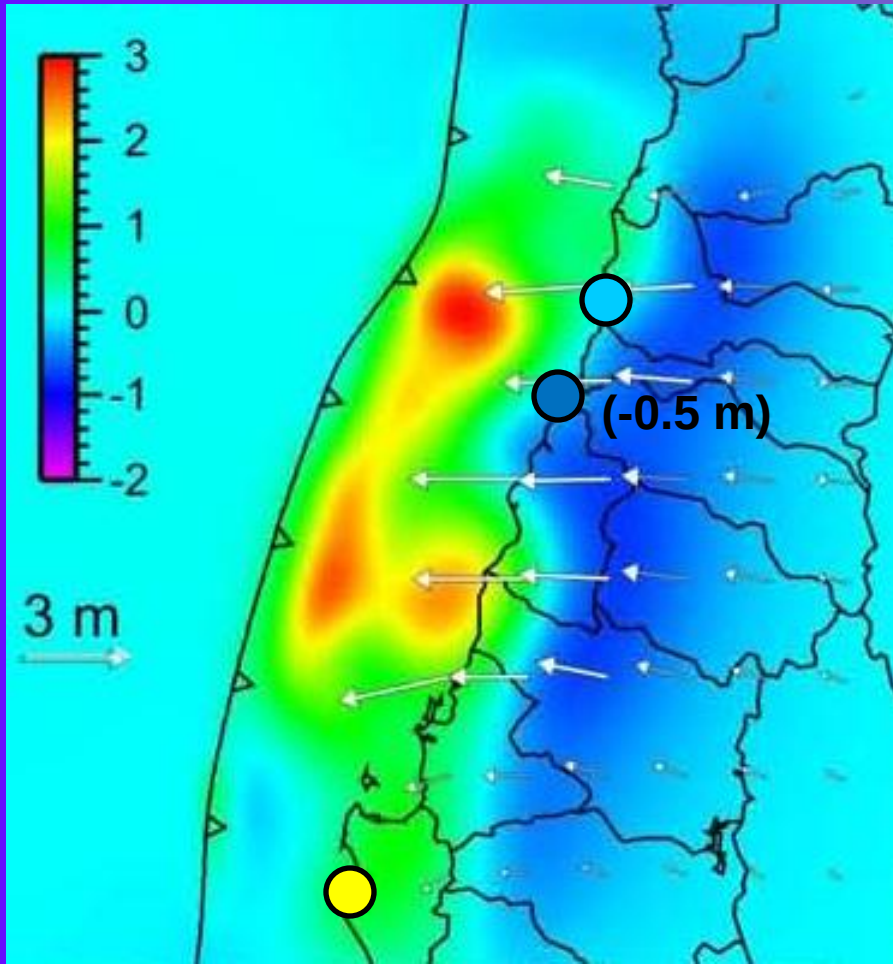
Tectonic Uplift



Lebu



Tectonic Subsidence



Iloca



Earthquake

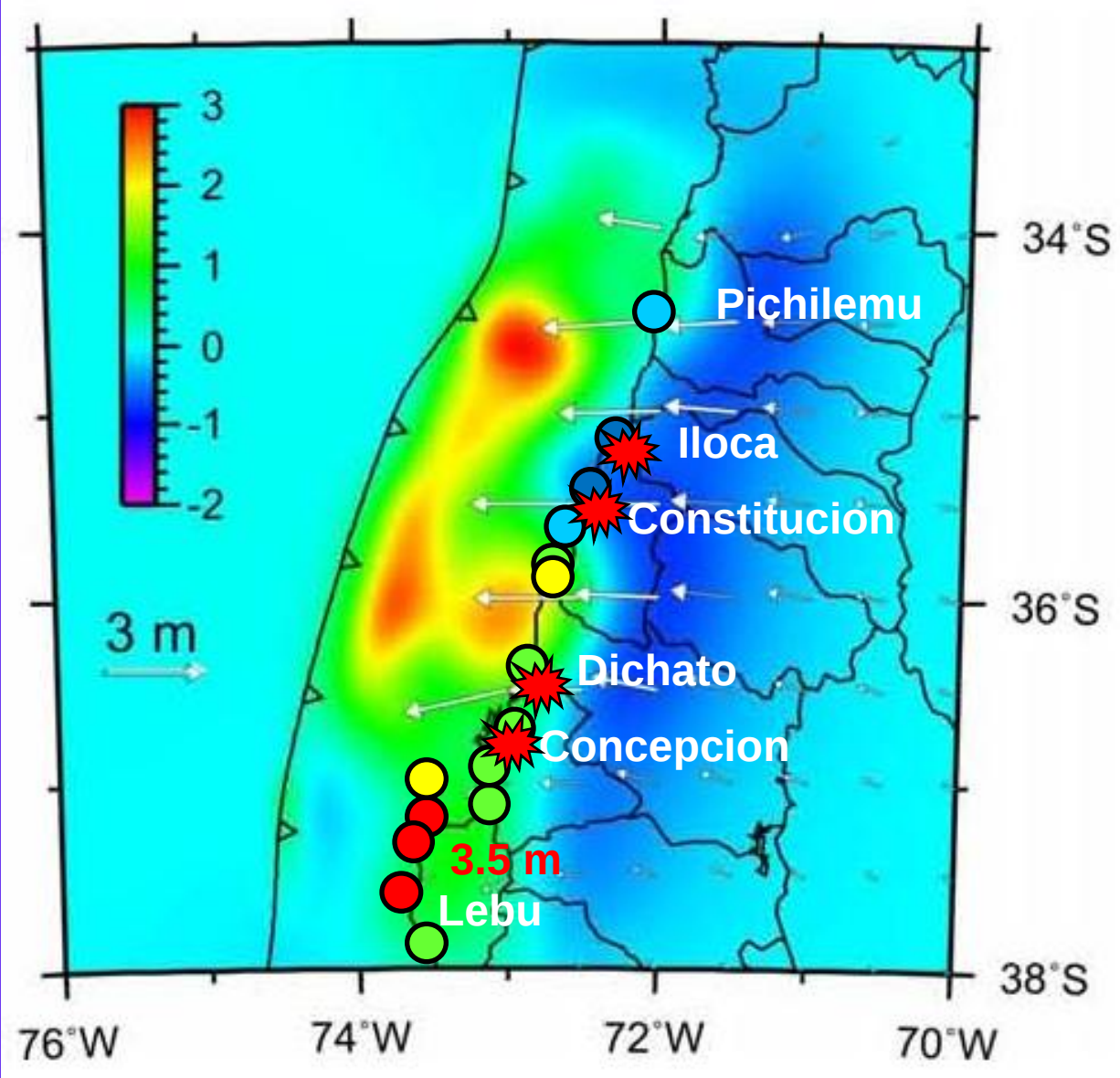
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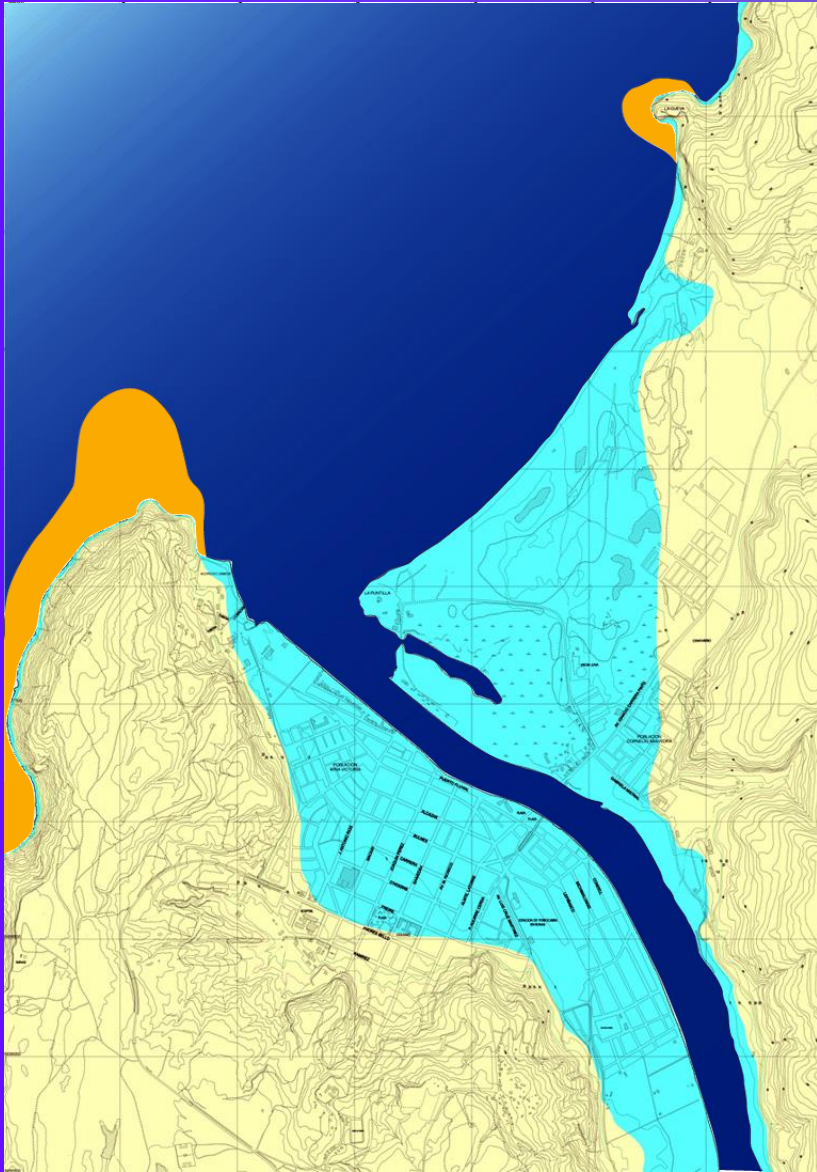
Uplift / Subsidence

Tsunami

Estimated Coseismic Vertical Displacements



Uplift Influenced Areas of Inundation



Landsliding: Highest concentrations--
Coastal bluffs on Arauco Peninsula
Logging roads in coastal mountains

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Landslides



Dry late summer =
Low soil moistures