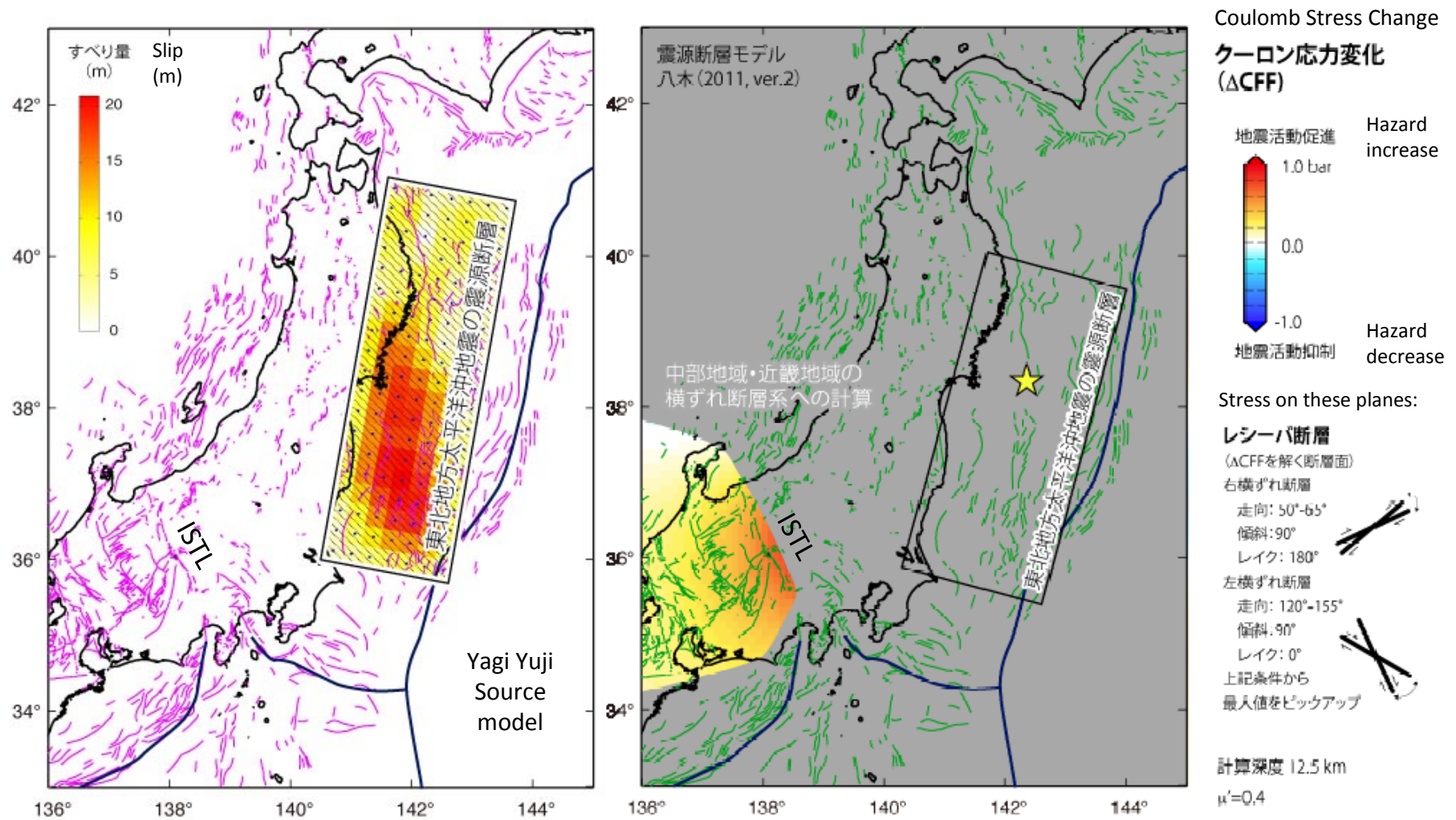


11 March 2011 M=8.9 Off-Tohoku, Japan Earthquake:

Preliminary results on Off-Tohoku Coulomb stress transfer

Shinji Toda (DPRI, Kyoto Univ.),
Ross Stein & Volkan Sevilgen (USGS)

The ISTL (likely North America-Eurasian plate boundary) is brought about 0.5 bar closer to failure by the Off-Tohoku M=8.9 earthquake

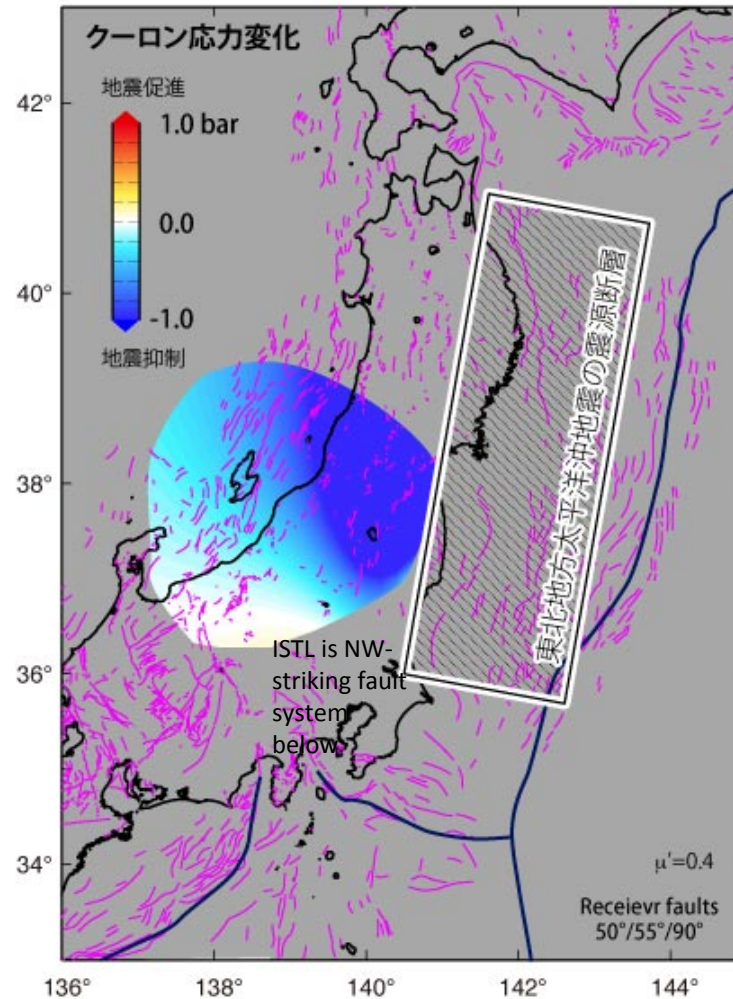
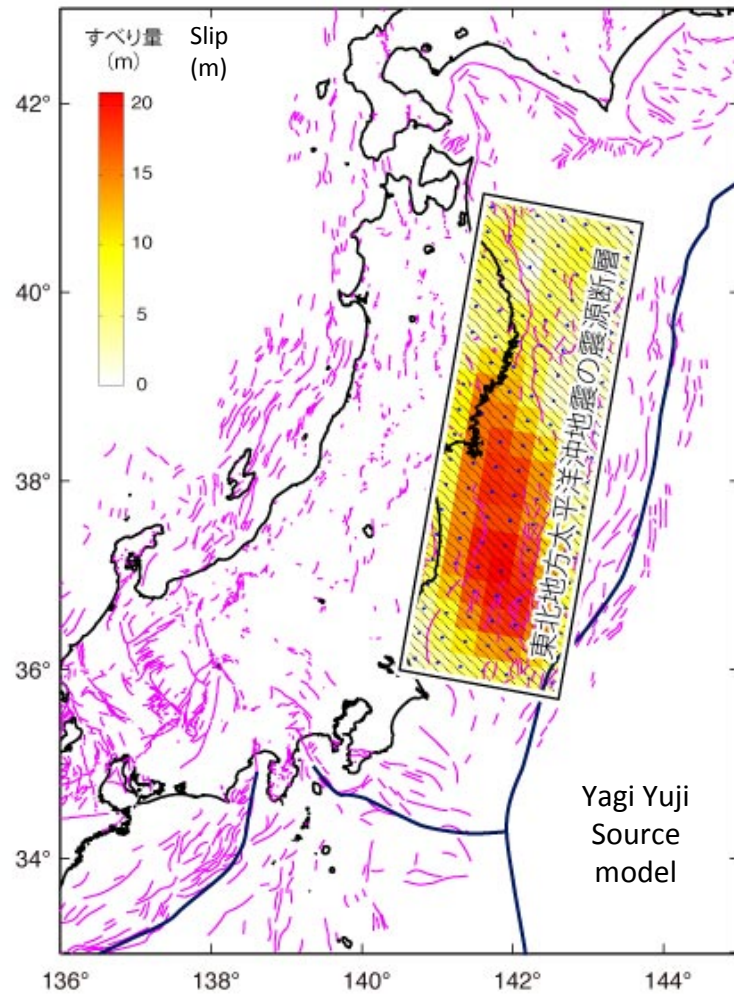


14 March 2011 Shinji Toda (DPRI, Kyoto Univ.), Ross Stein & Volkan Sevilgen (USGS)
 Depth

Assumed friction=0.4 12.5 km

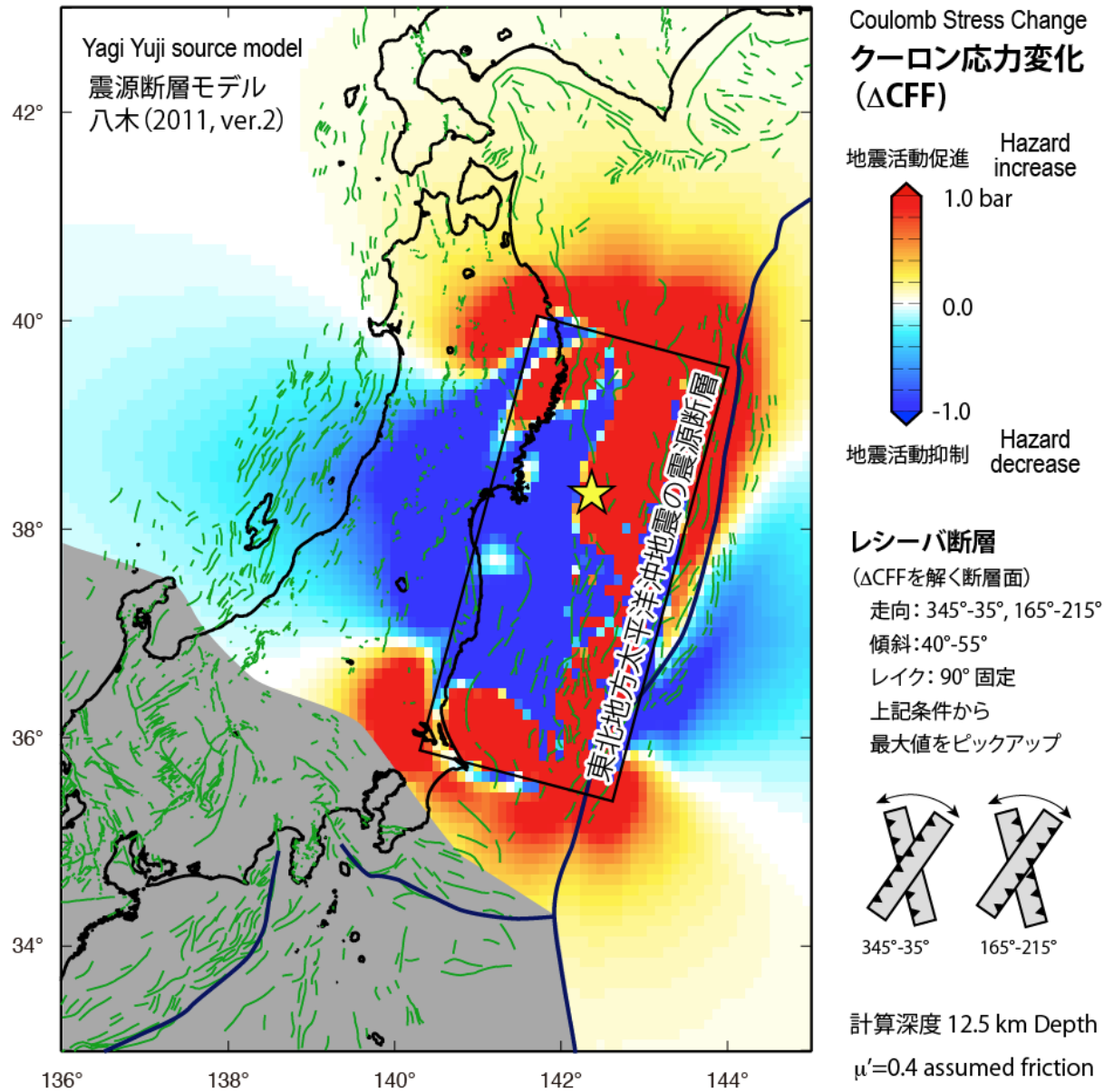
Stress generally drops or is unchanged on right-lateral Chubu faults in Niigata area

信越地方の北東-南西走向の逆断層への評価

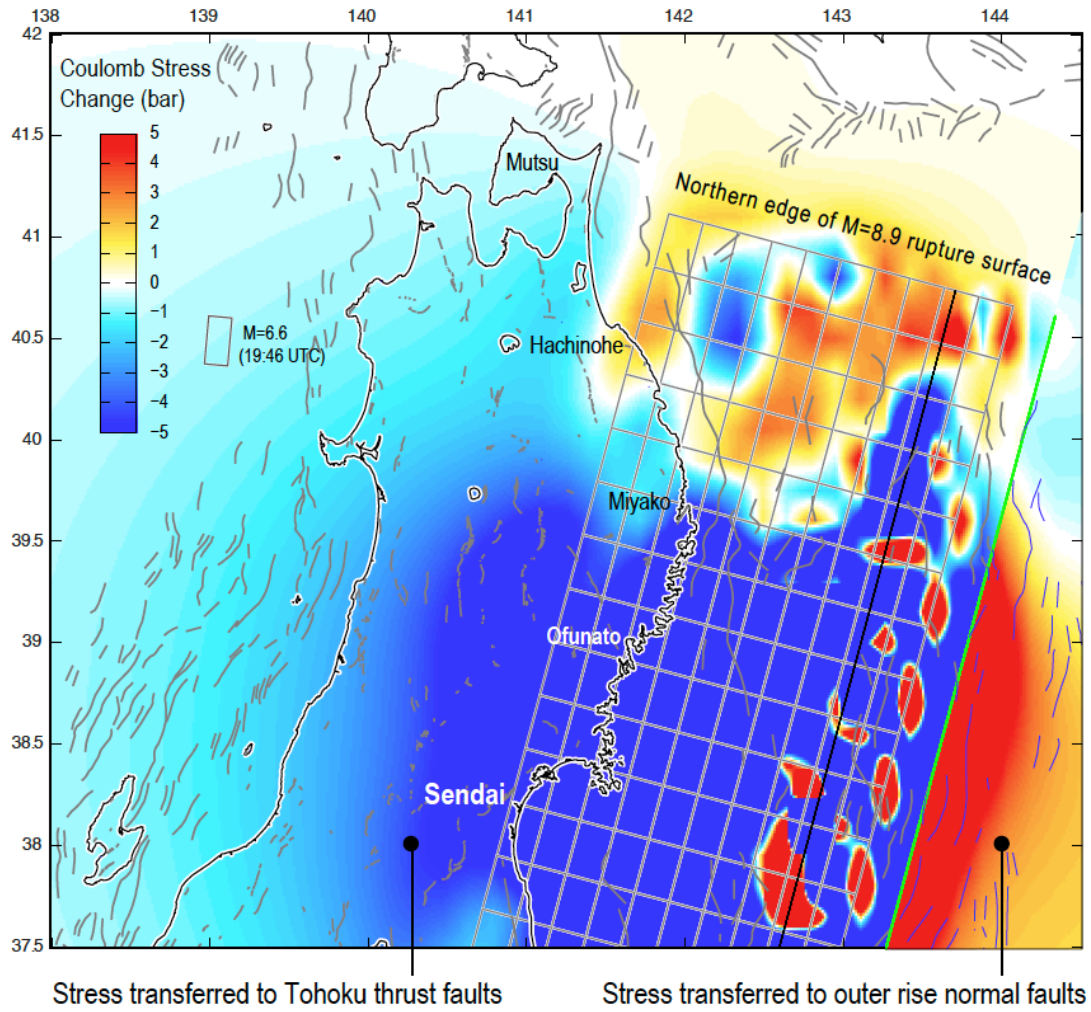


Coulomb Stress Change resolved on Chubu right-lateral fault system

Coulomb Stress Likely Dropped on Most Typical Inland Thrust Faults

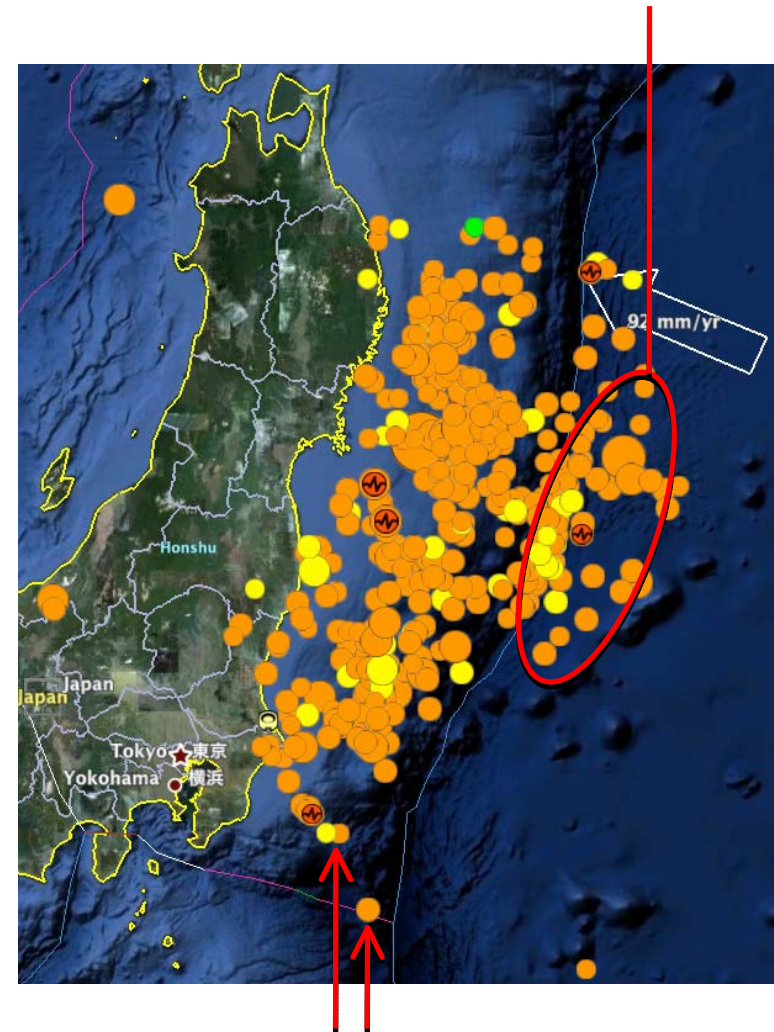


Coulomb stress change imparted by 11 Mar 2011 M=8.9 Off-Tohoku earthquake to typical crustal thrust faults on Honshu Island and to outer rise normal faults



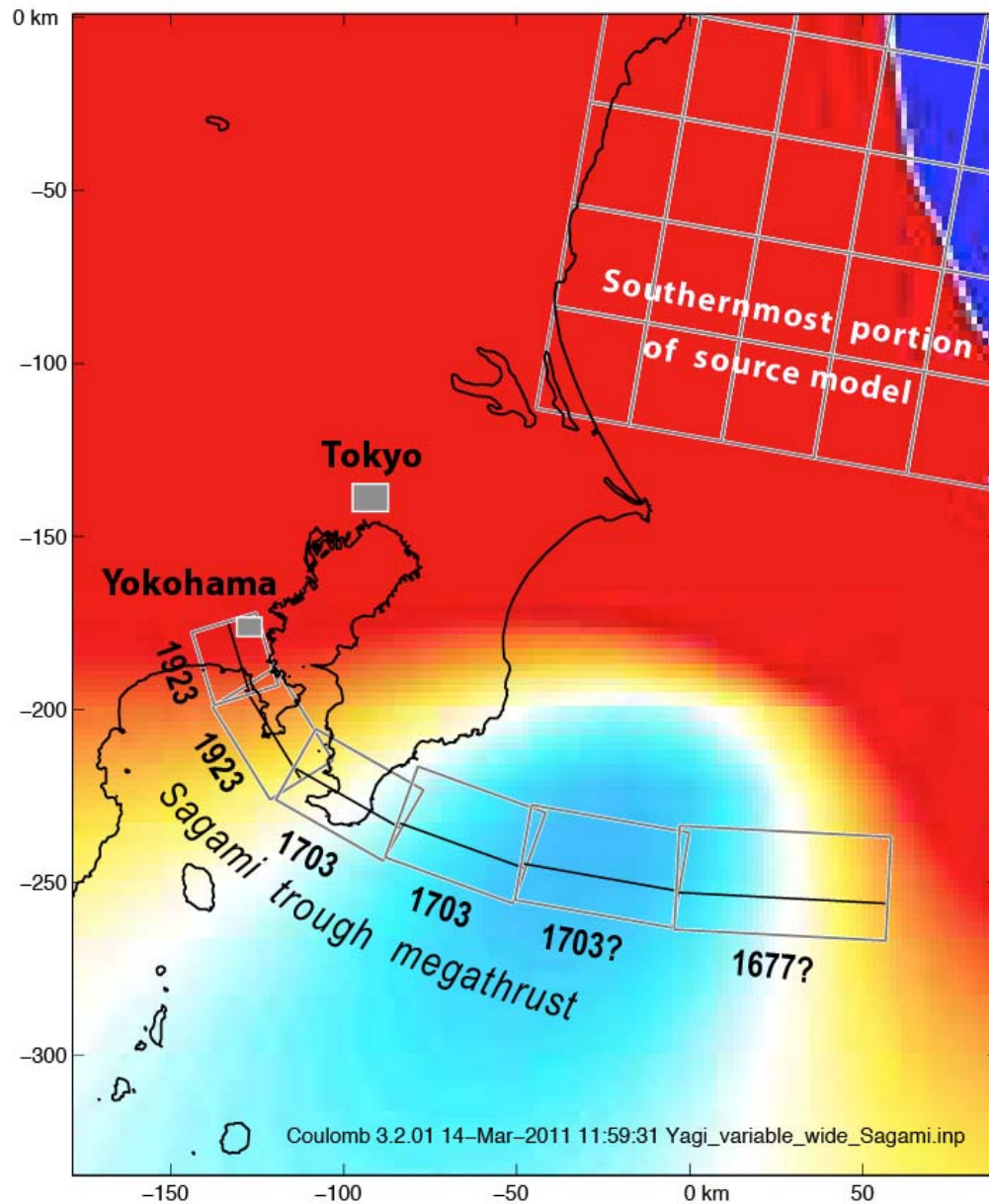
NEIC/Gavin Hayes preliminary source model, friction=0.4 (green line is where plane bisects the earth's surface)
 Receivers: Honshu fault strike/dip/rake = 190°/30°/90° 15 km depth; Outer rise faults = 198°/60°/-90°, 25 km depth

Abundant outer rise normal events are evident

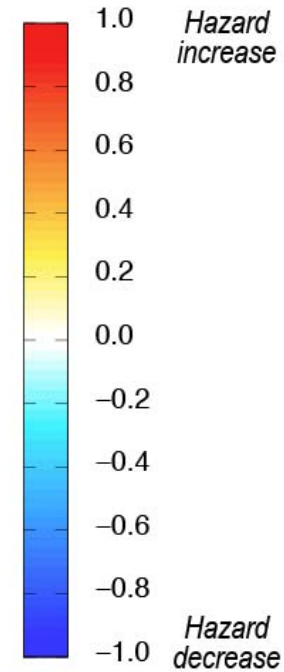


Several possible Sagami trough aftershocks have also struck offshore

Coulomb Stress may have increased modestly at both ends of the Sagami megathrust



Coulomb stress change (bar)



This result is highly sensitive to slip at the southern extent of source models

Assumptions:

Yagi Yuji's 13 Mar 2011 source model

Specified faults for Sagami trough

Strike/Dip/Rake = $290^{\circ}/25^{\circ}/150^{\circ}$

Depth: 15.00 km Friction: 0.40

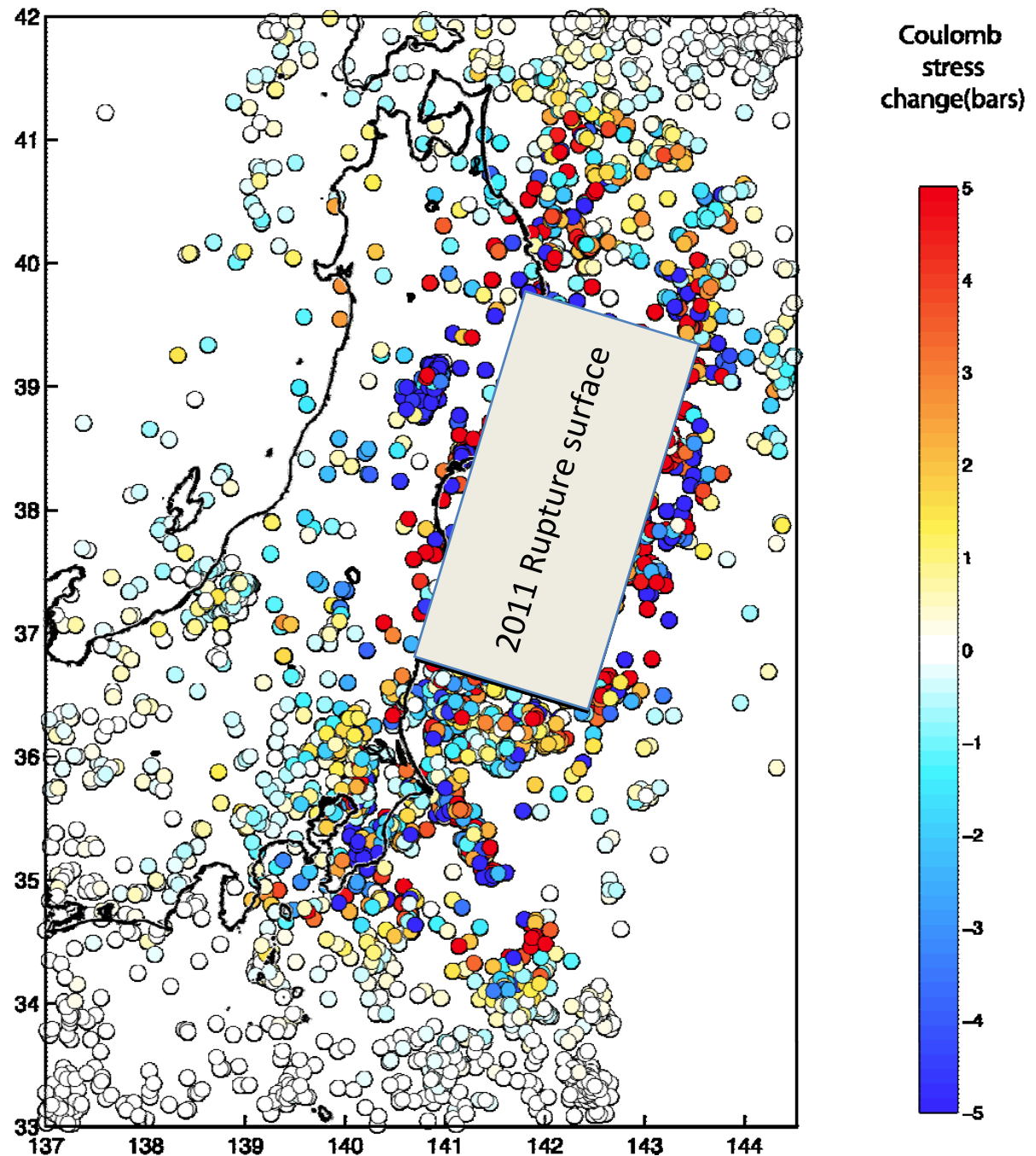
14 March 2011 Ross Stein & Volkan Sevilgen (USGS) and Shinji Toda (DPRI, Kyoto Univ.)

In this alternative strategy, we use the past decade of focal mechanisms as proxies for active faults, and calculate stress imparted by the M=8.9 Off-Tohoku earthquake

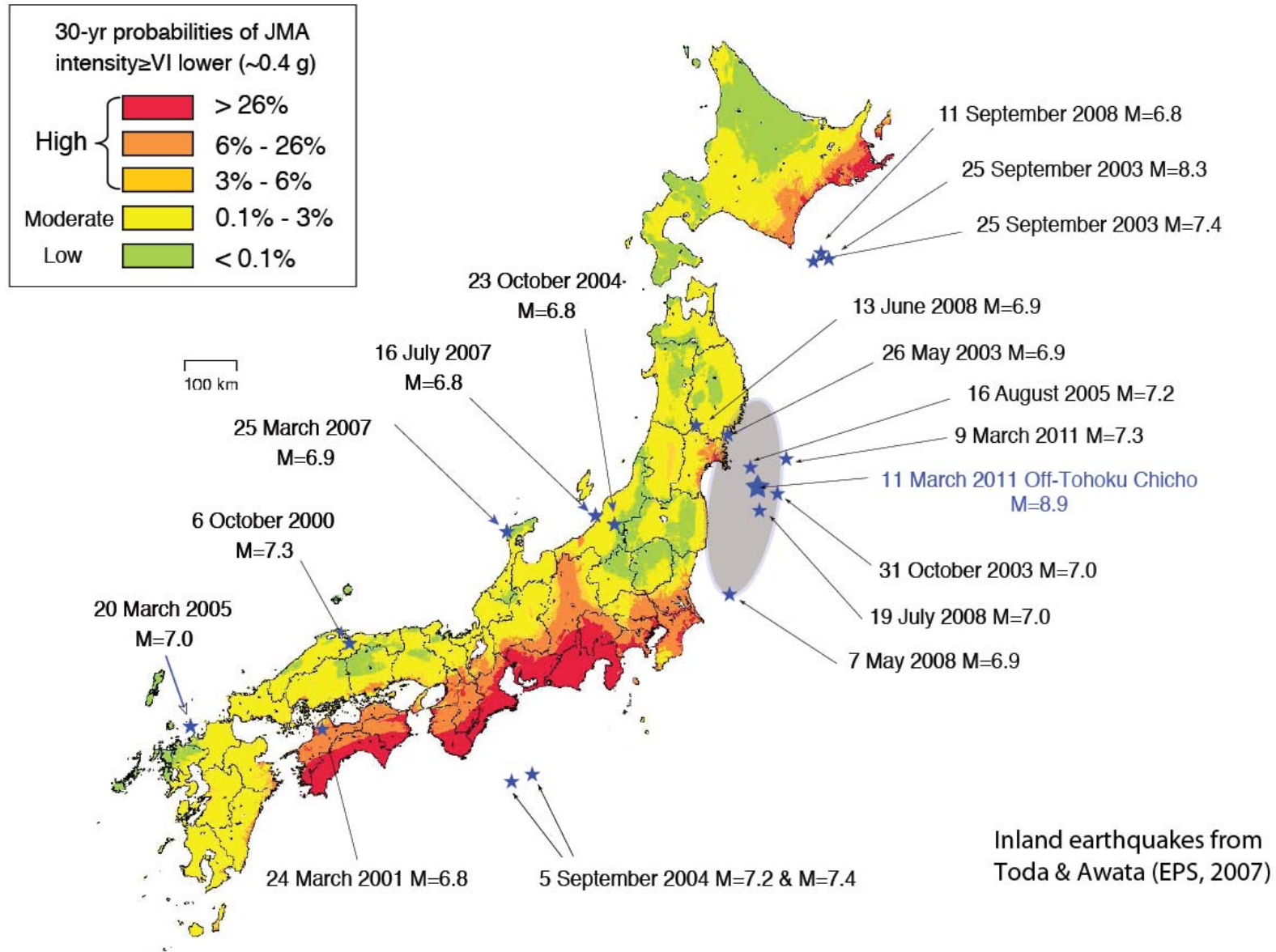
Stress generally drops on inland and Sagami trough faults, but there are many exceptions

NEIC/Gavin Hayes source model and Japanese F-Net mechanisms used

Volkan Sevilgen
(USGS) 14 Mar 2011



How well has the 2005 Japanese National Seismic Hazard Map forecast the last decade of earthquakes?



Will we do any better in the U.S? *We need to re-think how we assess maximum magnitudes and earthquake frequency-magnitude distributions*