１９７０年代　東京大学理学部地球物理

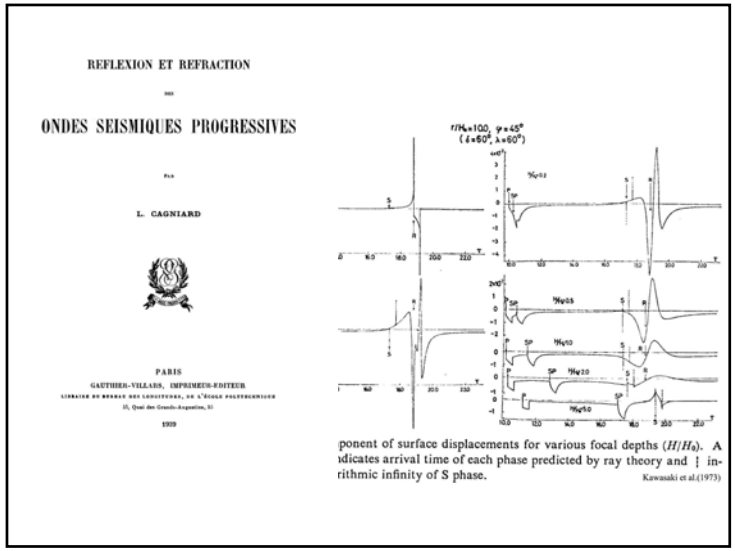
指導教官　浅田敏・佐藤良輔

もともとは地震波動論

弾性媒質のディスロケーションによる弾性波の解析解

弾性論と複素関数論の組み合わせ

強震動予測の草分け


REFLEXION ET REFRACTION

ONDES SEISMIQUES PROGRESSIVES

L. CAGNIARD

PARIS

ponent of surface displacements for various focal depths (H/H_0). A
ndicates arrival time of each phase predicted by ray theory and ‡ in-
rithmic infinity of S phase.

Kawasaki et al.(1973)

１９８０年代　富山大学理学部

異方性

異方的媒質の表面波の固有値の解析解

（ほとんどテンソル解析）

マントルの大規模異方性

異方的媒質の表面波の

固有値の解析解

（ほとんどテンソル解析）

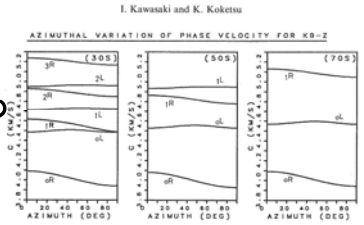


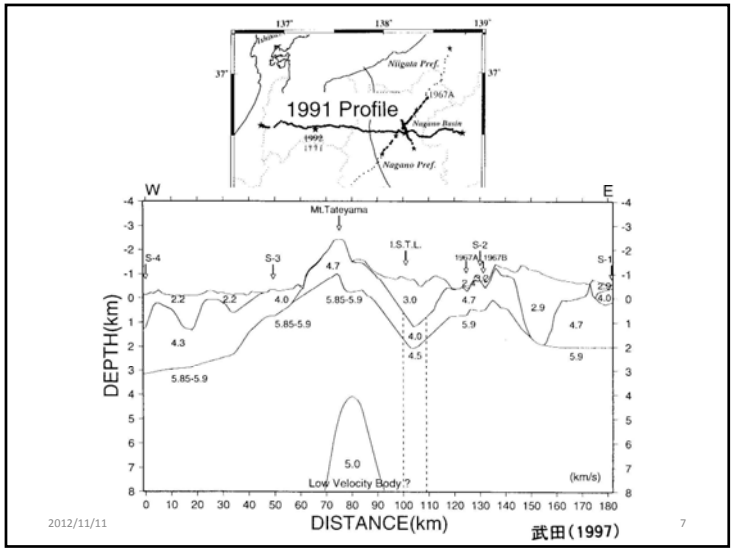
Fig. 7. Azimuthal variations of phase velocities in KB-Z model at three periods of 30, 50, and 70 s. Azimuthal-branches of $_0$L and $_1$R at a period of 30 s are approaching close to each other for azimuths of 70°–90°.

Fig. 8. Azimuthal variations of radial component of group velocities in KB-Z model at three periods of 30, 50, and 70 s. Azimuthal-branches of $_0$L and $_1$R

１９９０年代　富山大学理学部

スロー地震の研究

北アルプスの深部構造

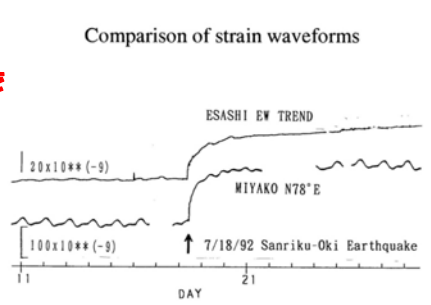


宮城沖から茨城沖で

巨大地震が

起こらないのは

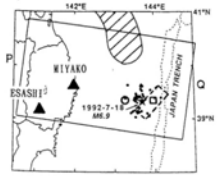
何故か？



1993年

Nature から

リジェクト



news feature

A seismic shift in thinking

Earthquake researchers in the United States have long shunned the word 'prediction'. But, thanks to improved data and a change in public perception, cracks are beginning to appear in their resolve. David Cyranoski tracks the debate.

Both phenomena illustrate the complexity of earthquake generation, a welcome advance for researchers who knew that the simple models used for predictions were woefully incomplete. If the complex system could be understood, prediction might be possible, says Kawasaki, who tracked a silent quake[3] in 1992. "These provide new perspectives that most people couldn't have imagined ten years ago," he says.

Silent quakes and non-volcanic tremors have even been found together in the Cascadia subduction zone, off the coast of the northwest United States and Canada[4]. Retrospective data analyses show that these have occurred in

"Making predictions to the public must only be done with the consensus of the scientific community."
— Ichiro Kawasaki

think it would work this well," he says. Rundle is also working on a map for Japan. On 23 October, a magnitude 6.8 quake hit Niigata — killing at least 25 people and injuring more than 2,000 — near one of Rundle's hotspots.

Rundle says his maps reduce the total area known to be seismically active to 24% of active fault areas, which would help to allocate resources for retrofitting bridges and other vulnerable infrastructure. "I wish people would use it now," he says.

Keilis-Borok also uses statistics and patterns to make predictions: his algorithms are derived from histories of large earthquakes. His most recent predic-

2012/11/11　Nature 28 October 2004 issue　9

２０００年代　京都大学防災研究所

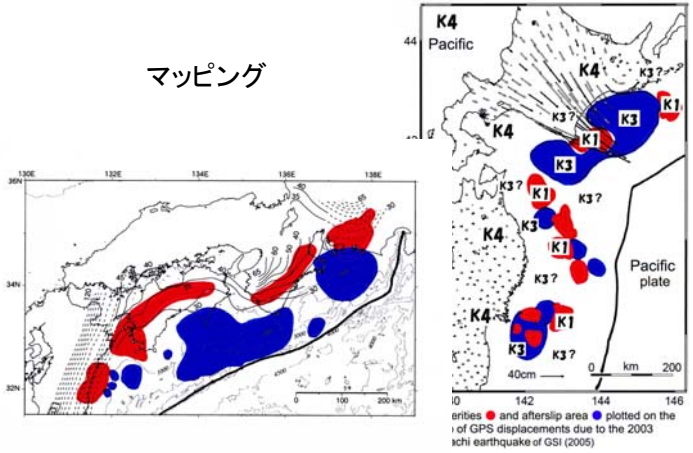
地球深部構造

列島規模の地殻変動

スロー地震とプレート境界ダイナミクス

東北日本太平洋沖では巨大なサイレント地震が繰り返すと思っていた

マッピング



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3. 『地震予知の科学』東京大学出版会，東京，2007.
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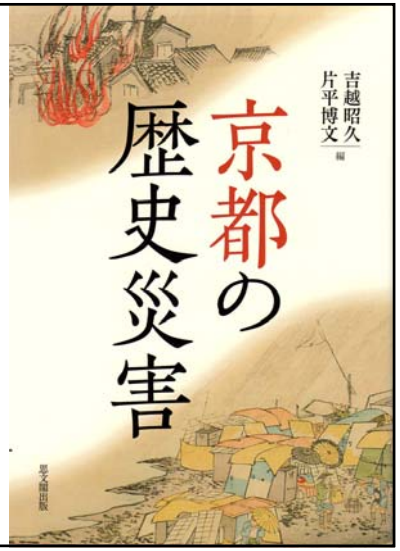
4. 『災害社会』京都大学学術出版会，京都，2009

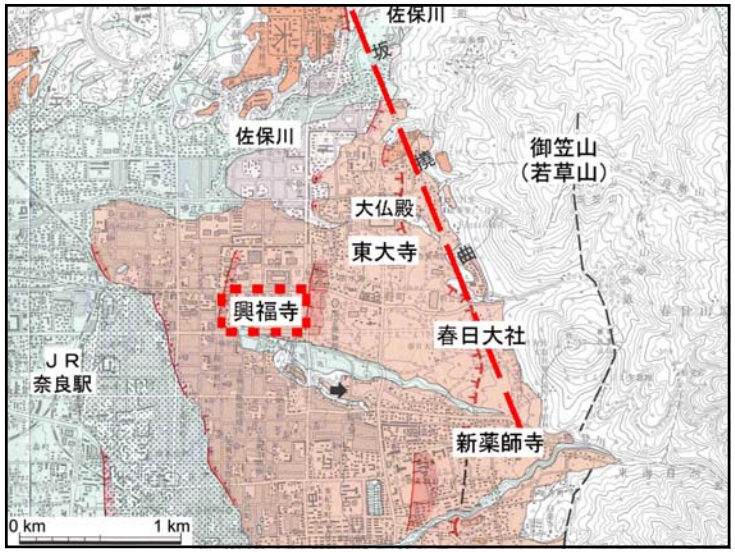
２０１０年代　立命館大学歴史都市防災研究センター

京都や奈良の1000年の時間スケールの災害リスク

『京都の歴史災害』
吉越昭久・片平博文編
思文閣、183-194、2012.

京都御所の地震殿と地震災害

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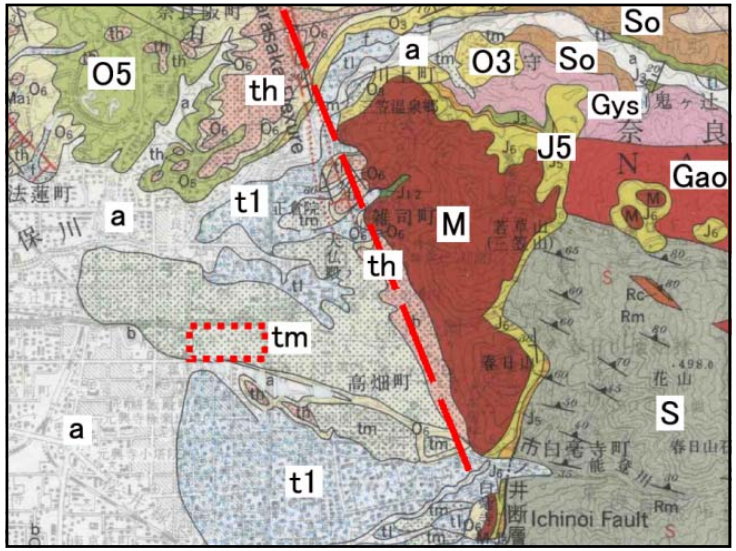
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（若草山）
興福寺
春日野町
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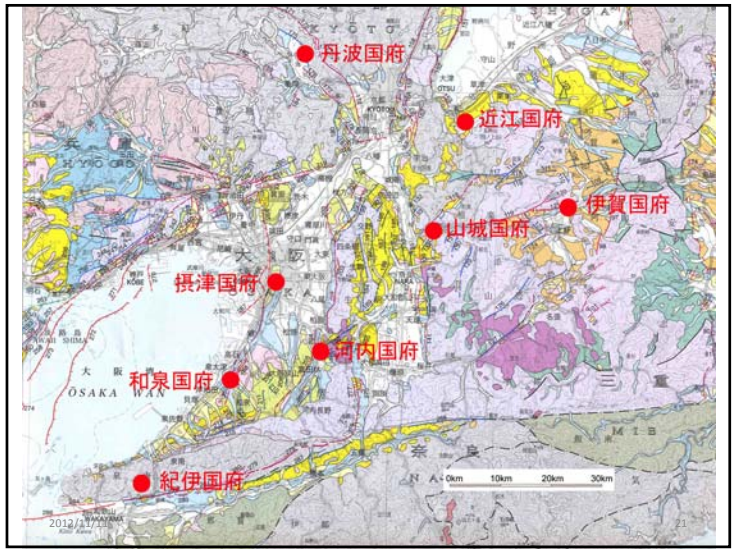
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伊賀国府
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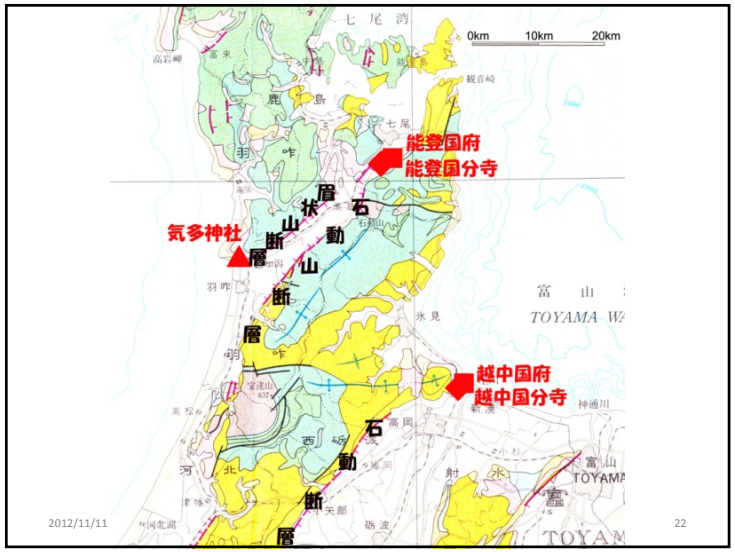
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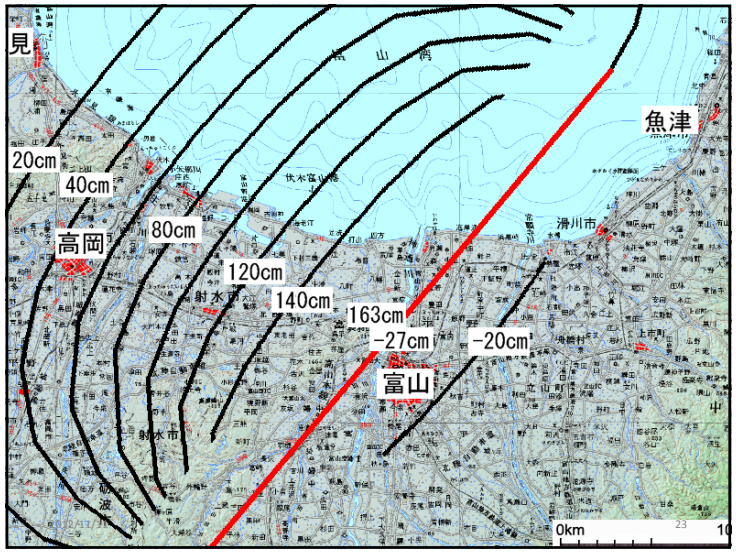
気多神社
越中国府
越中国分寺
2012/11/11
22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