THE WAVE OF EARTHQUAKE PREDICTION RESEARCH IN JAPAN

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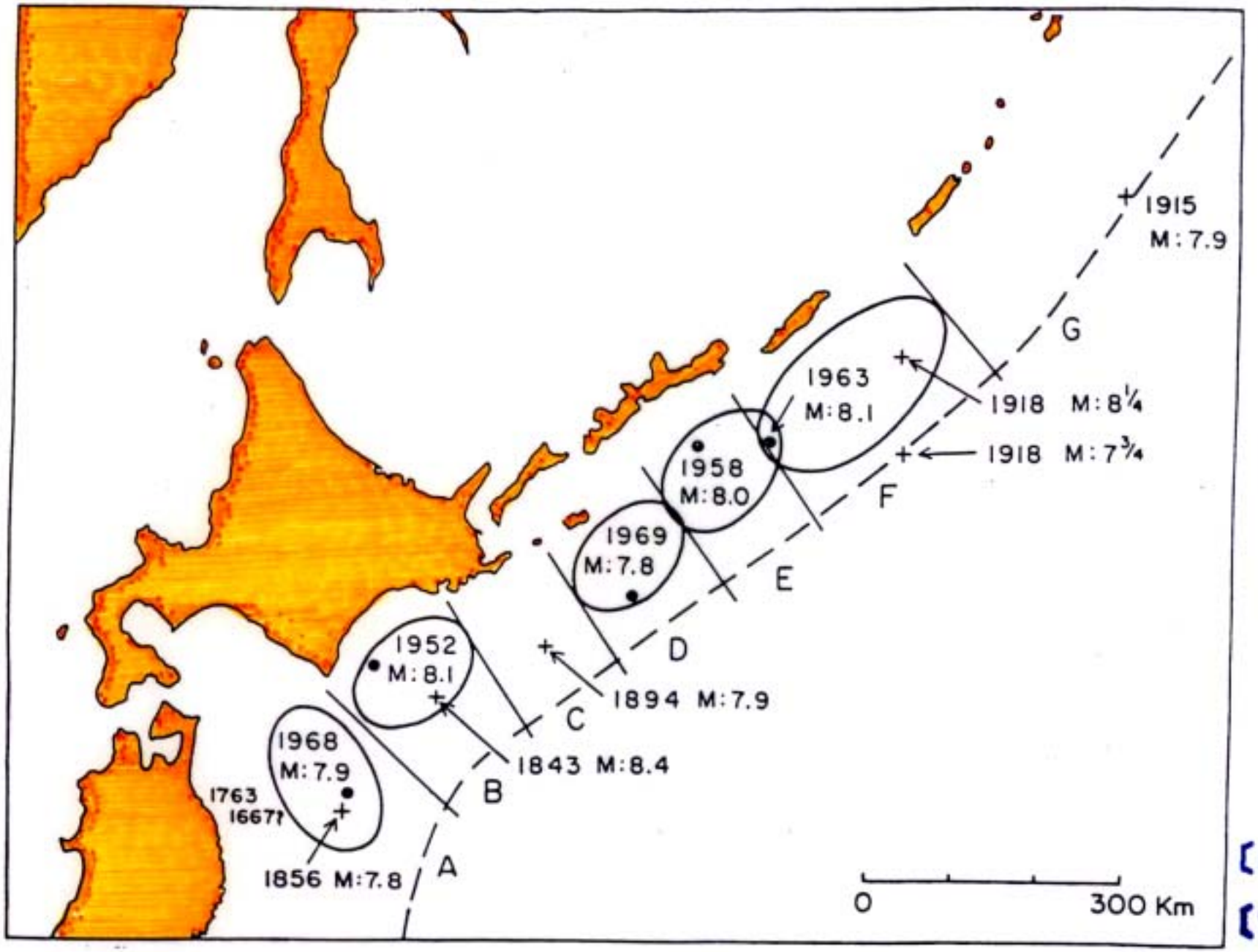
Old Program

THE FIRST-TERM PROGRAM
FOR EARTHQUAKE PREDICTION RESEARCH
(1965-1968FY)

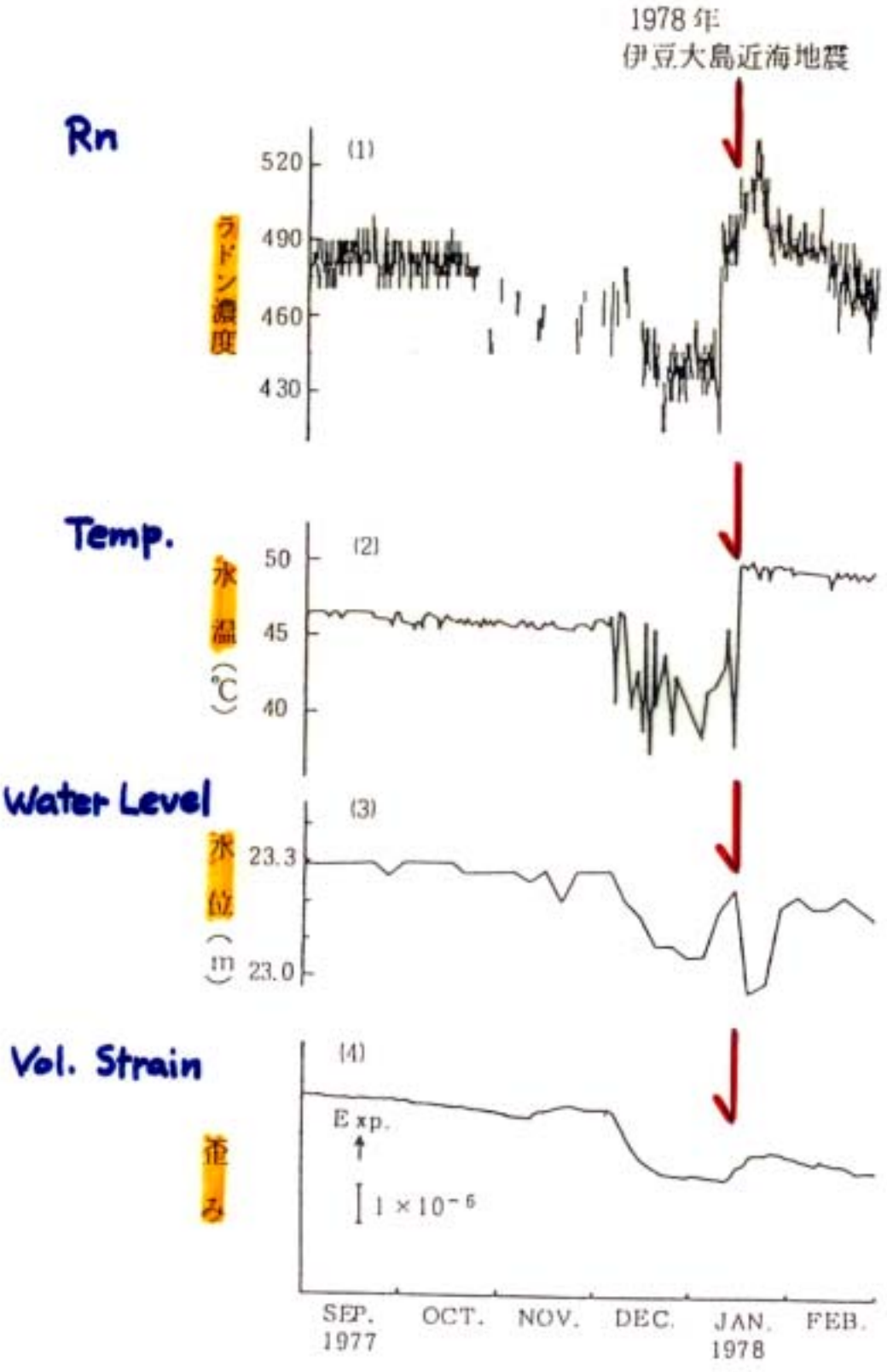
1. Geodetic Measurement of Crustal Deformation
2. Deployment of Tide Gauge Stations
3. Continuous Observation of Crustal Deformation
4. Investigation of Seismicity
5. Observation of Seismic Wave Velocity by Using Artificial Explosions
6. Field Investigation of Active Faults
7. Observation of Geomagnetism and Earth Current
8. Increase of Academic and Related Positions



【Utsu (1972)】

【宇津, 1972】

1978 Izu-Oshima-kinkai Eq.



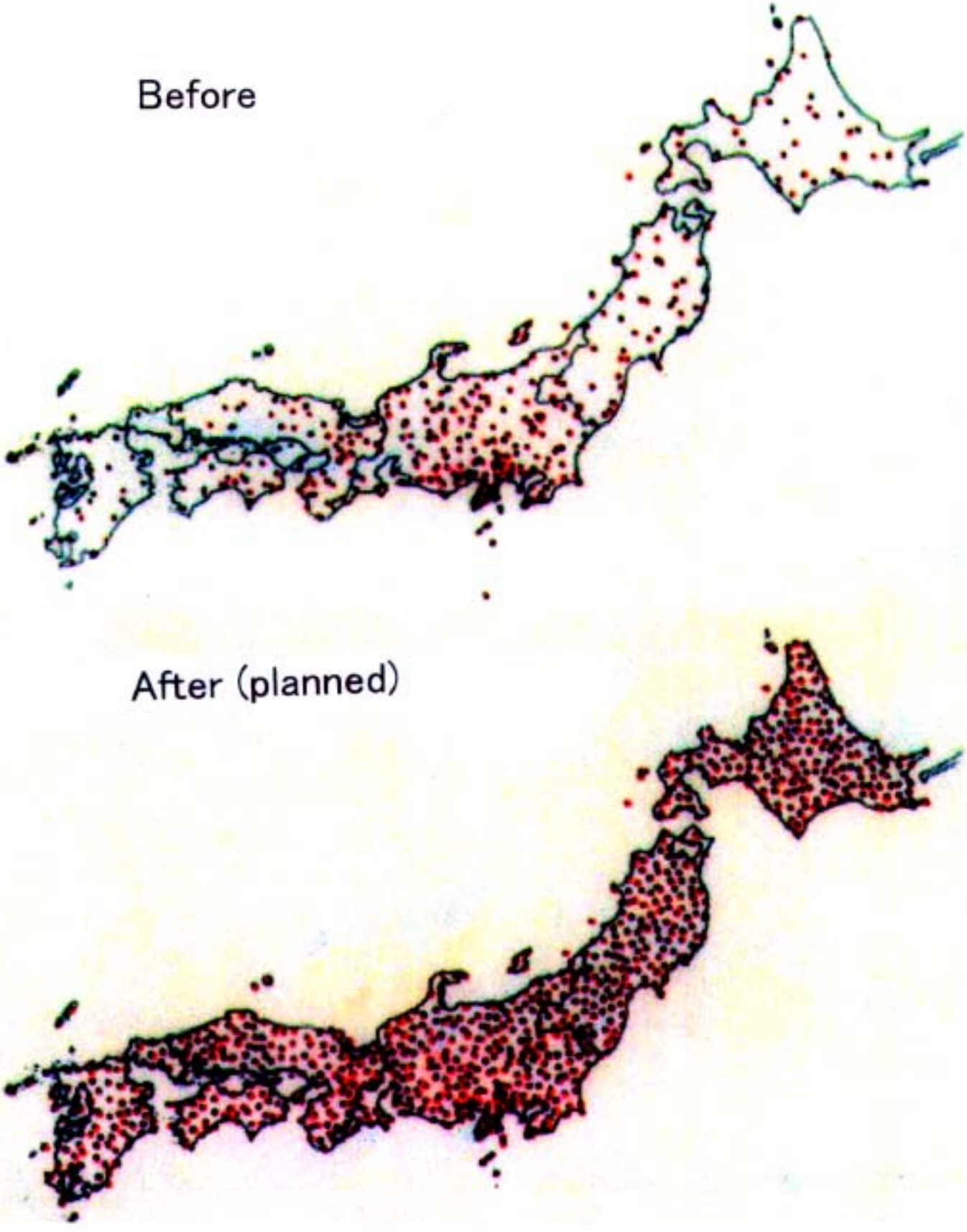
[Wakita (1980)]

New Program

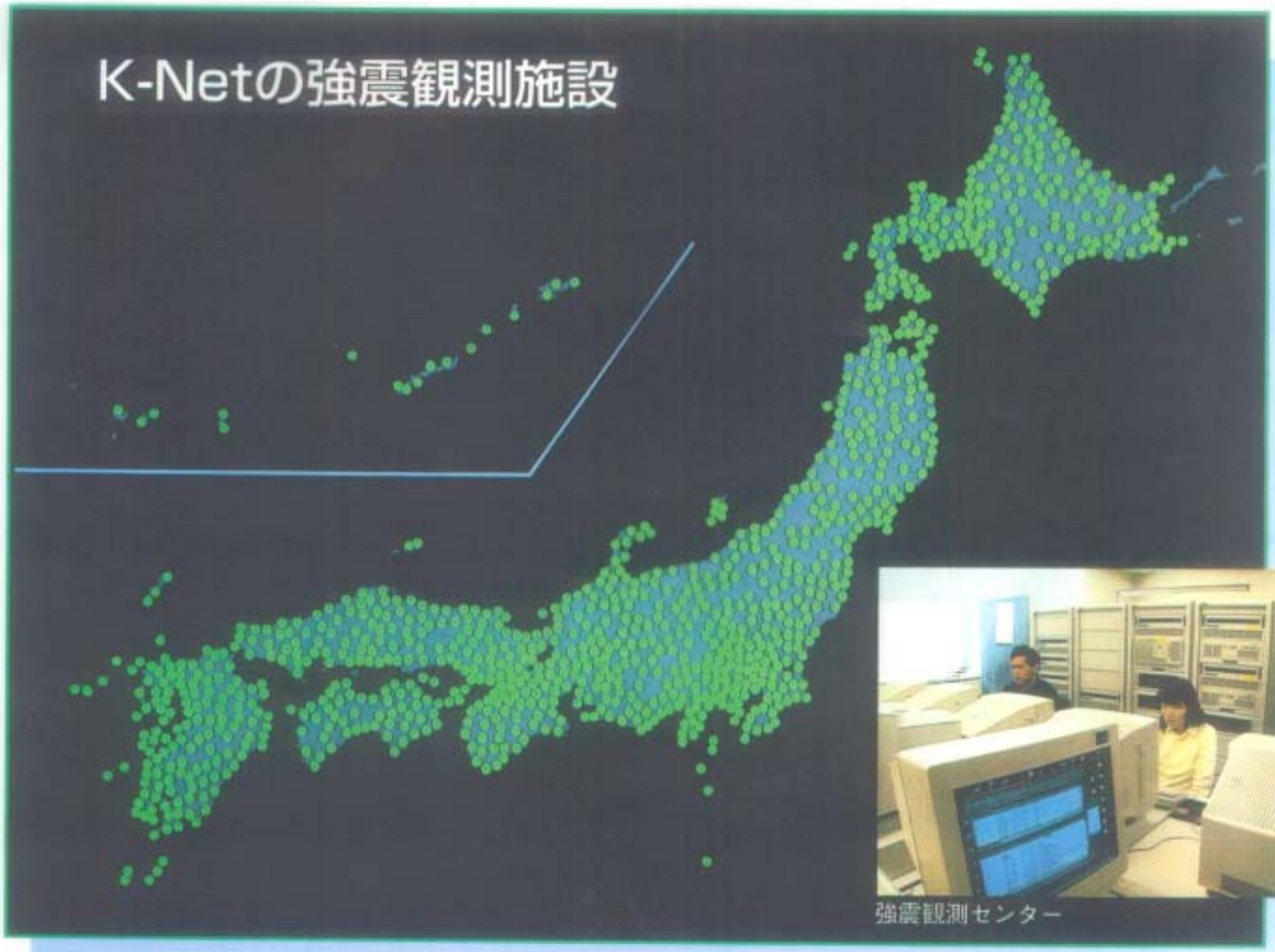
NEW OBSERVATIONAL RESEARCH PROGRAM FOR EARTHQUAKE PREDICTION (1999-2003FY)

1. Observational Researches to Reveal the Nature of Crustal Activity Governing Earthquake Occurrence
   - steady-state process of regional scale
   - earthquake preparation process
   - imminent process
   - co-seismic and post-seismic source process
   - strong ground motion
2. Observational Researches to Construct Advanced Monitoring Systems of Crustal Activity
   - nation-wide scale
   - specific areas
3. Development of Simulation and Observation Technologies
   - simulation algorithms
   - new observation technologies
4. Strengthening Structures to Promote the Program
   - circulation and storage of archived data
   - education and employment of professionals
   - cooperation with researches for volcanic eruption prediction
   - international cooperation

Hi-net Stations Map



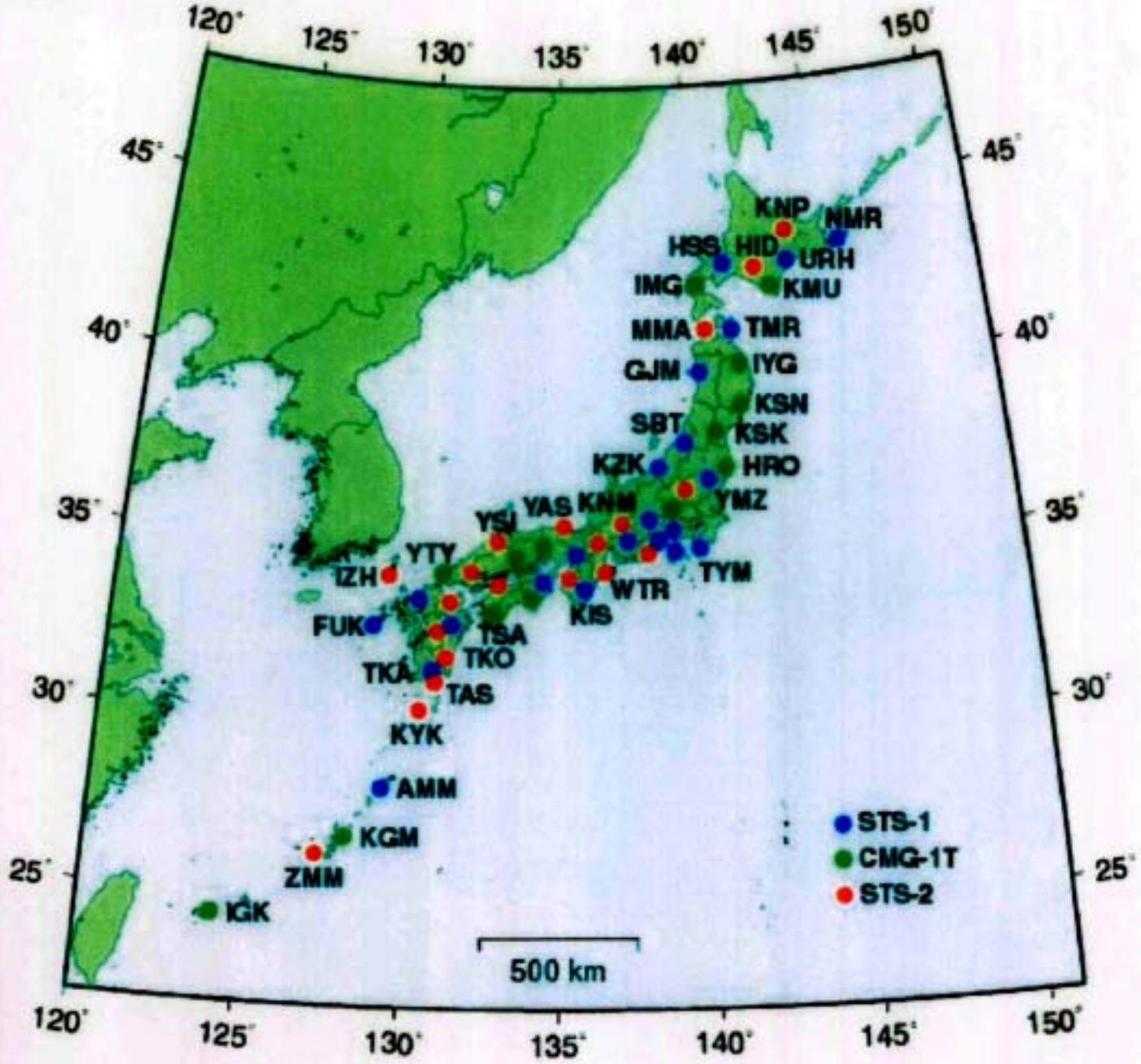
[NIED: National Research Institute for Earth Science and Disaster Prevention]



「NIED: National Research Institute for Earth Science and Disaster Prevention」

F-net Stations Map

- Japan Islands area



[NIED: National Research Institute for Earth Science and Disaster Prevention]

Apr. 2000 – Apr. 2001

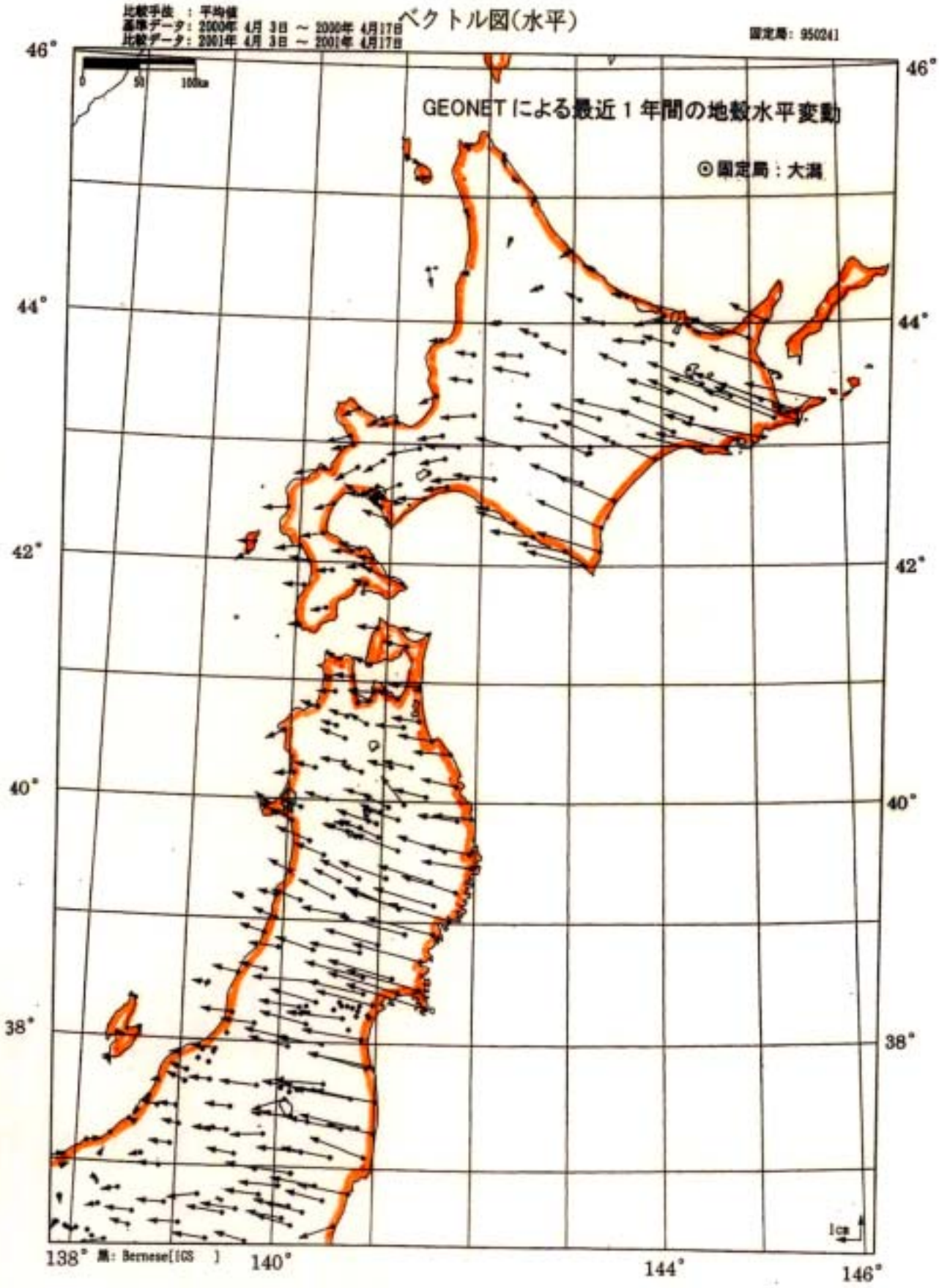
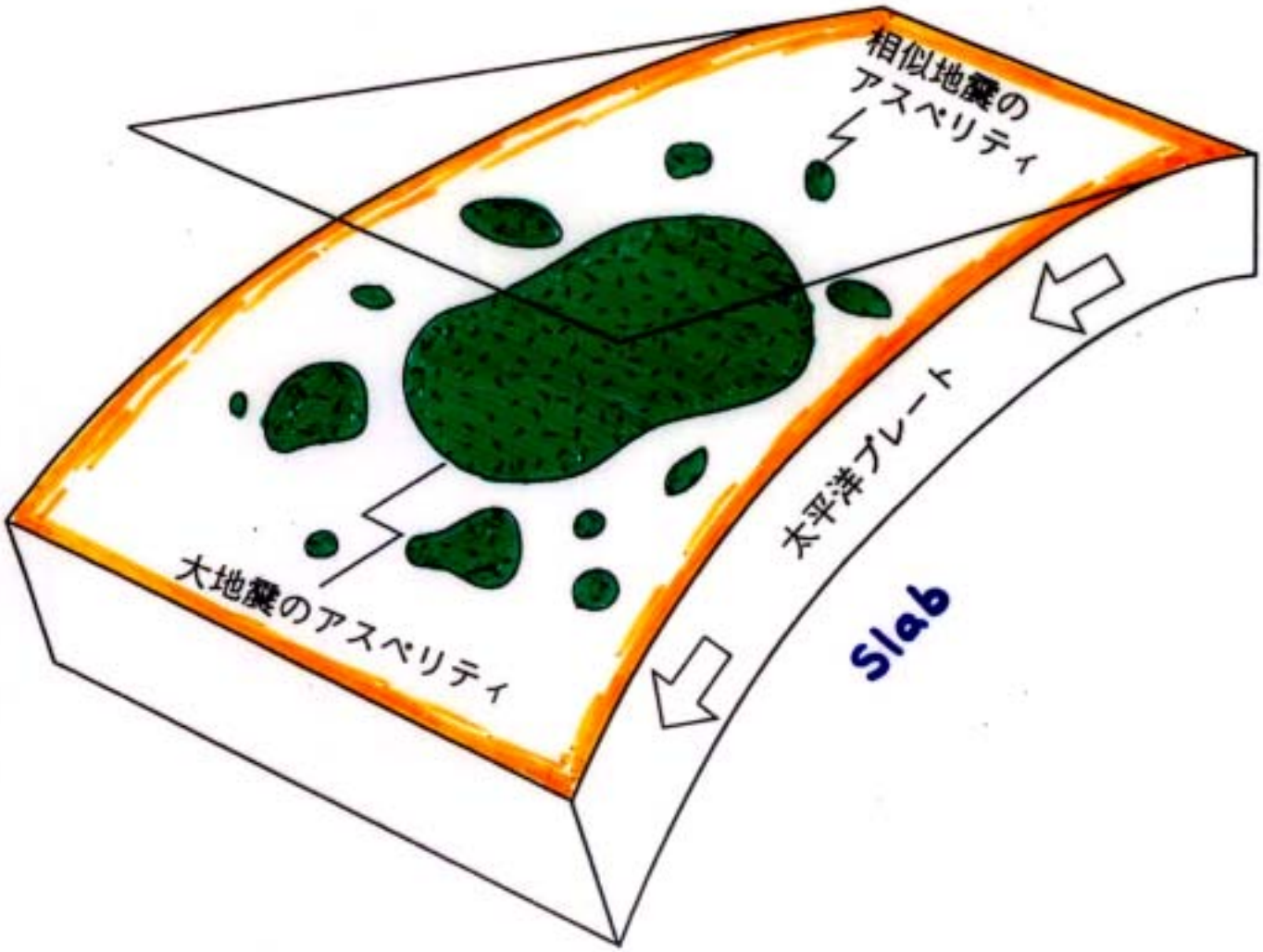


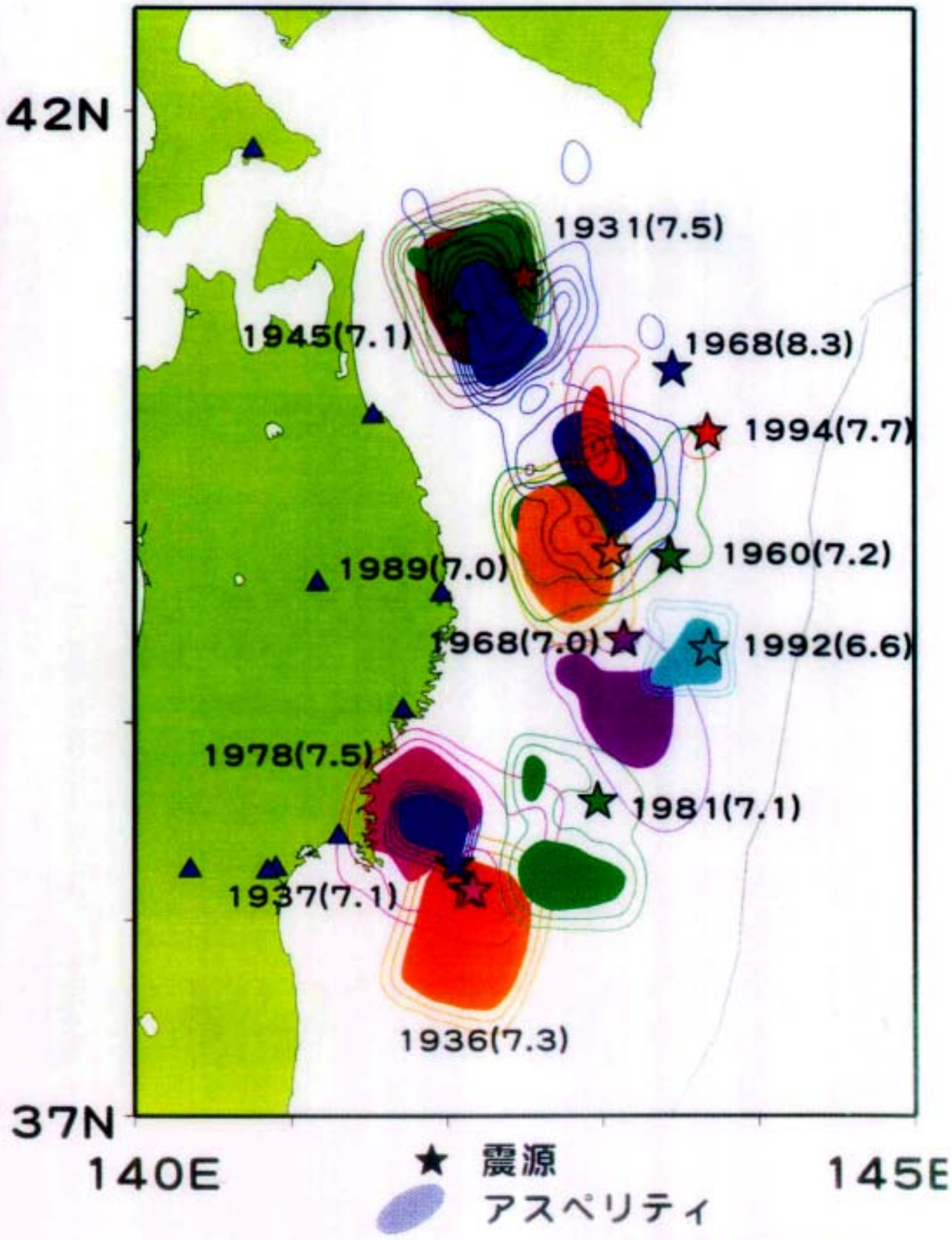
Fig. 1-(1) Annual horizontal displacement velocities at permanent GPS sites during 2000/04 - 2001/04 (1 of 3).

[GSI (2001)]

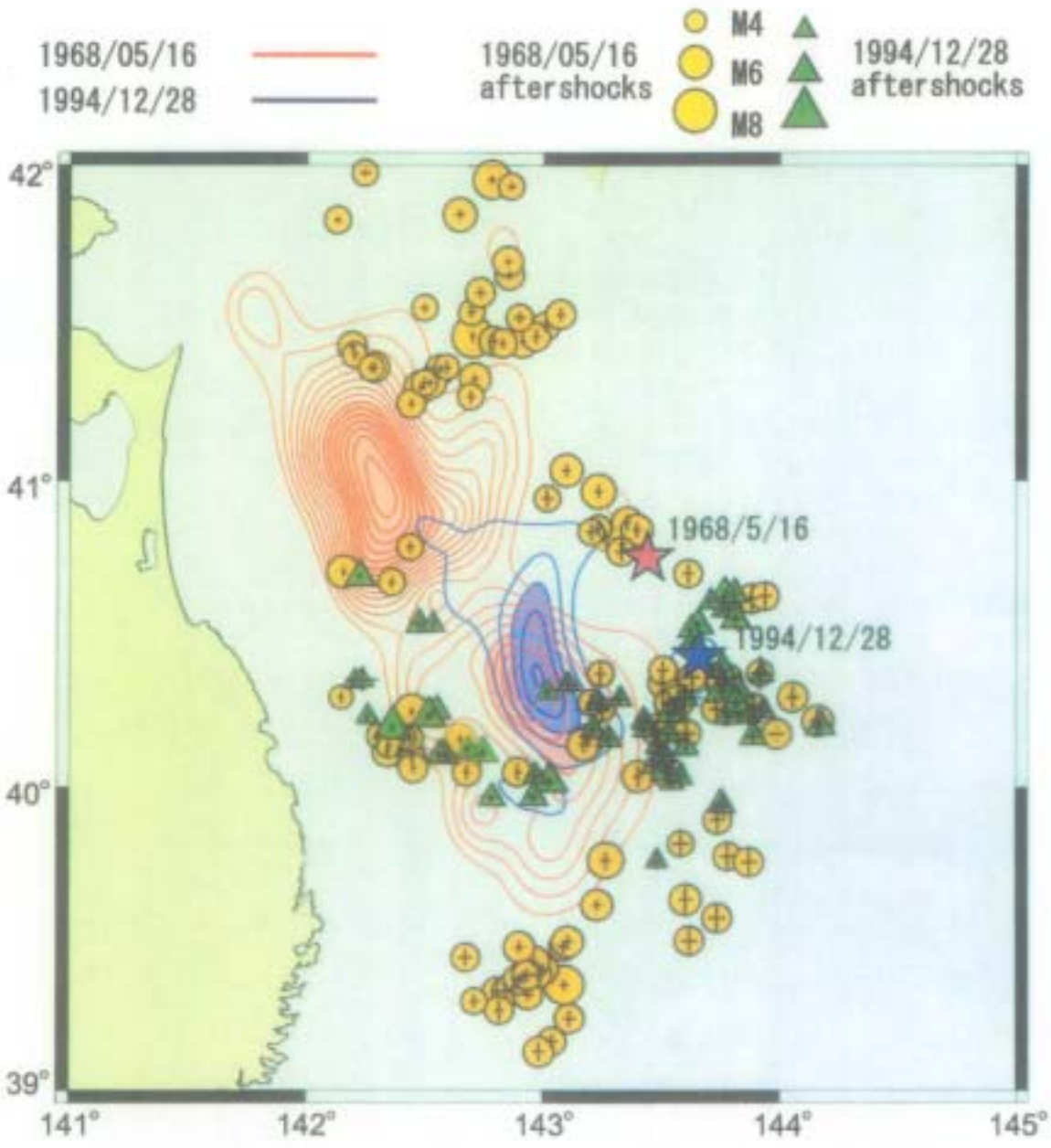
アスペリティ モデル

Asperity





Yamanaka & Kikuchi
[山中・菊地 (2001)]



Nagai et al.
〔永井・他(2001)〕

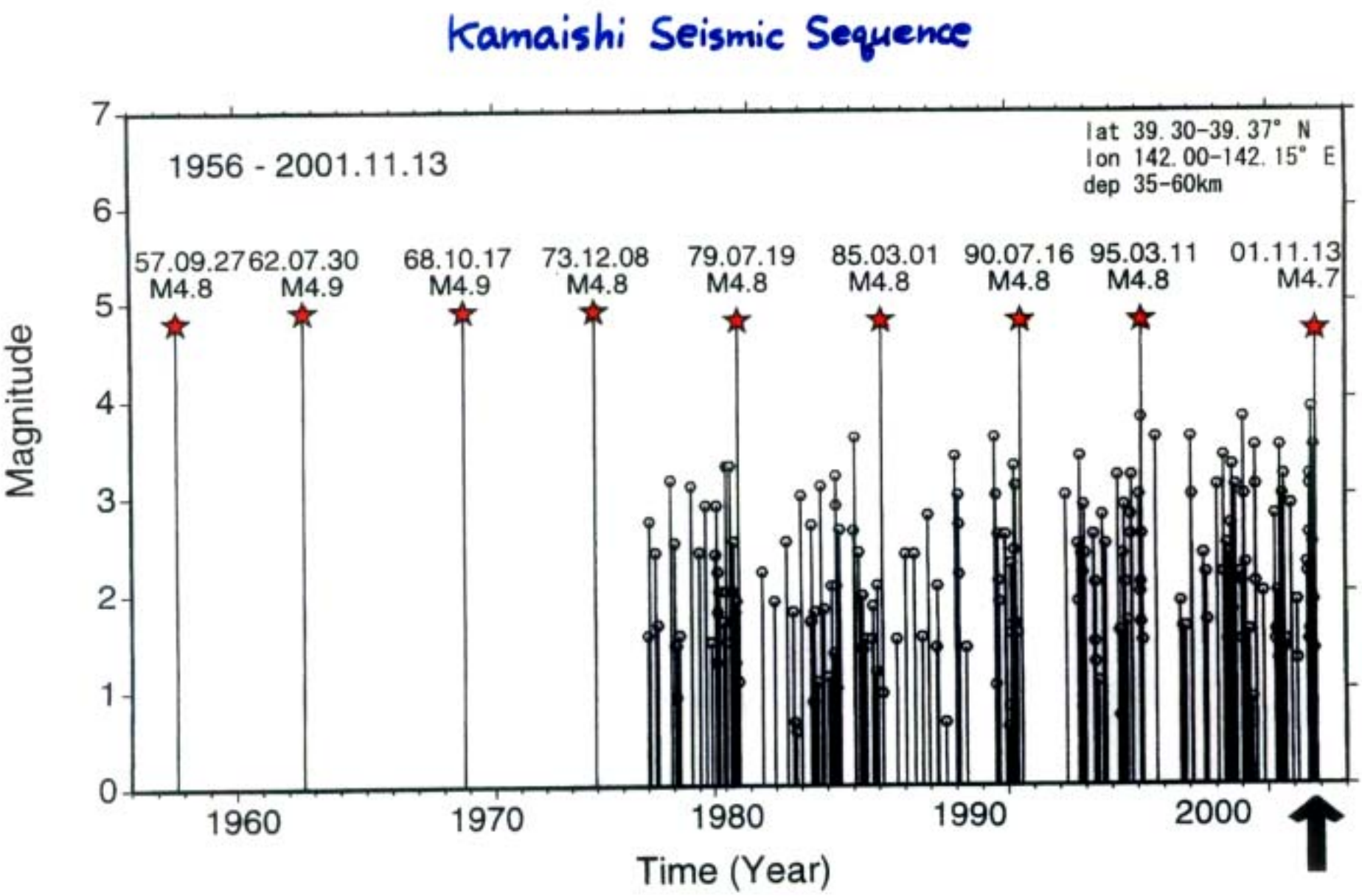
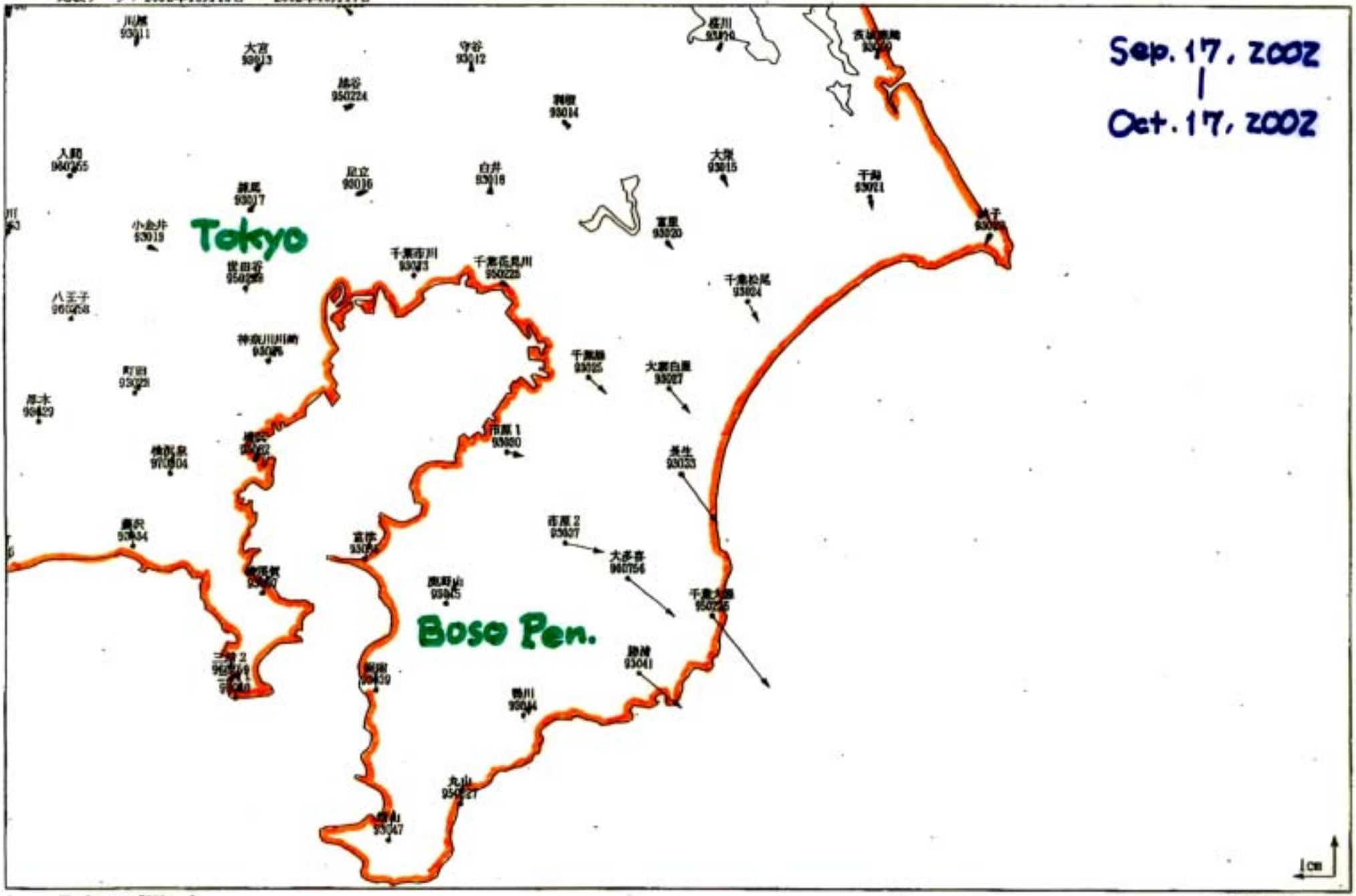


図 5　釜石沖の地震クラスターで発生した地震の M-T 図.

比較手法　：平均値
基準データ：2002年 9月11日 ～ 2002年 9月17日
比較データ：2002年10月15日 ～ 2002年10月17日

ベクトル図(水平)

固定局：952110



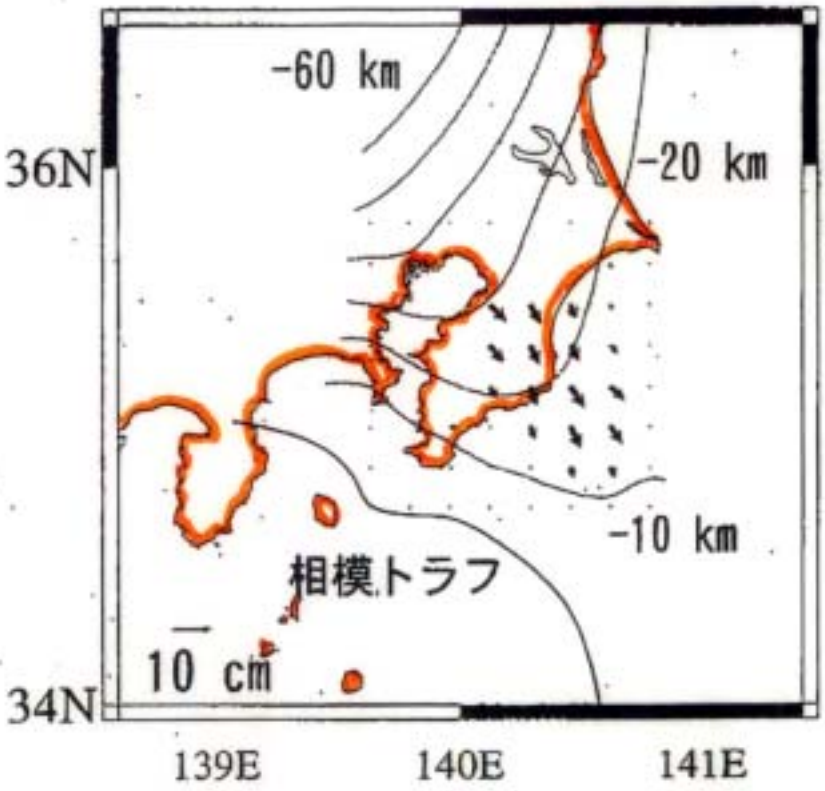
凡：Bernese[COC　]

国土地理院

[GSI (2002)]

陸側プレートのフィリピン海プレートに対するすべり分布（プレート境界面での滑り量）

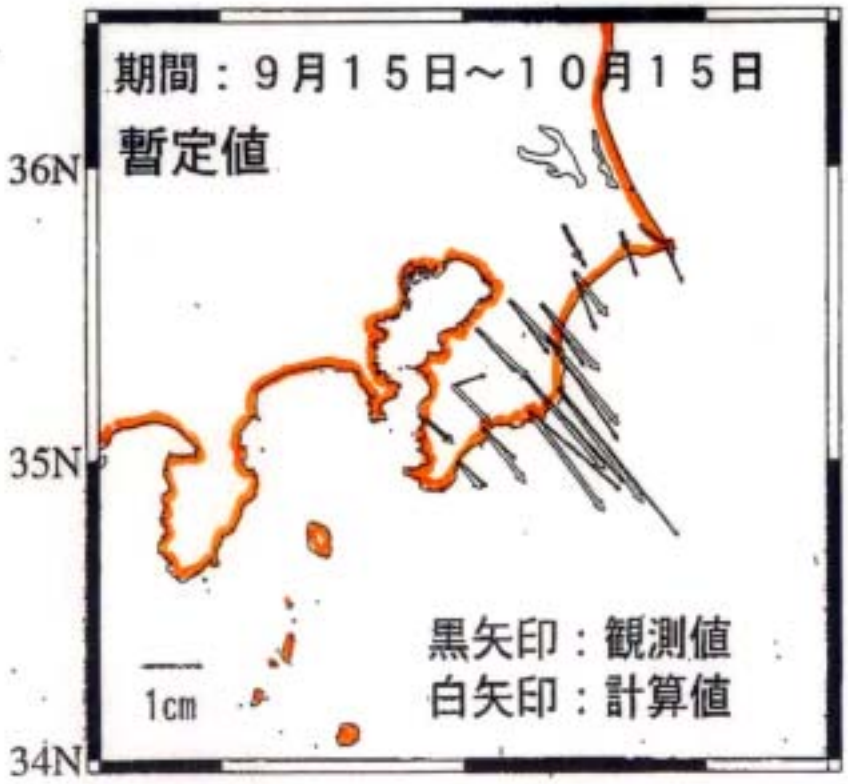
モーメントマグニチュード (Mw) ～6.5程度
暫定的モデル（剛性率33GPa）



等深度線はフィリピン海プレート上面の深さ

Slip

上記モデルに基づく地殻変動量の計算値と実際の観測値

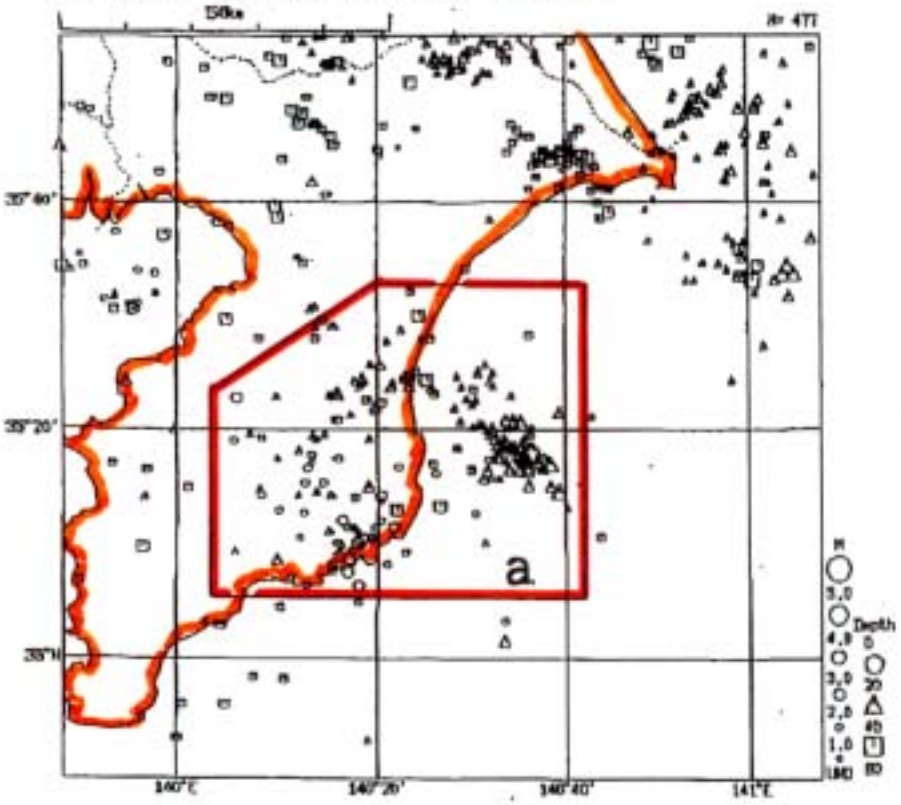


Obs./Cal.

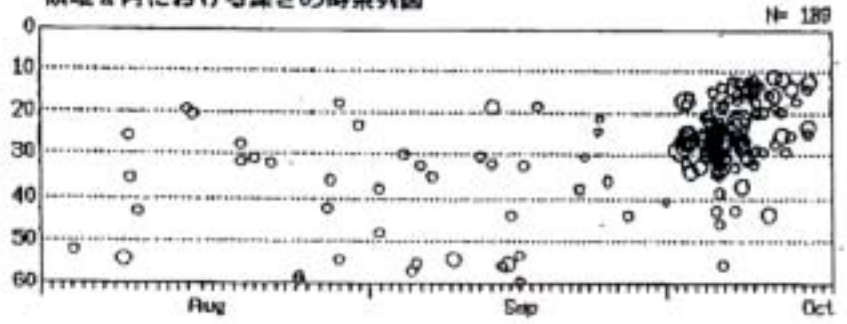
【GSI (2002)】

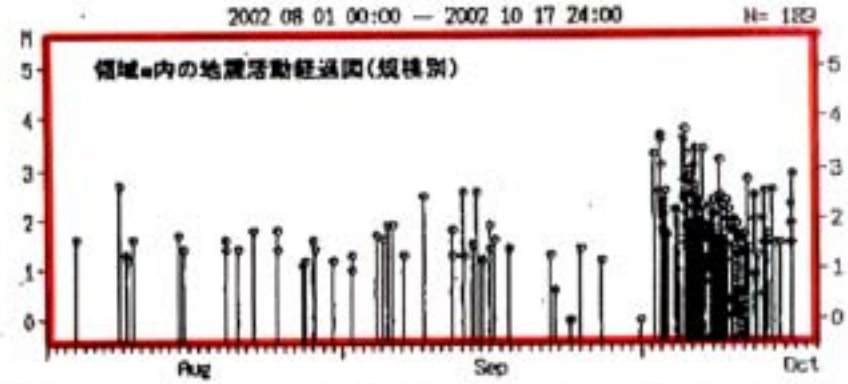
2002年10月始めからの地震活動

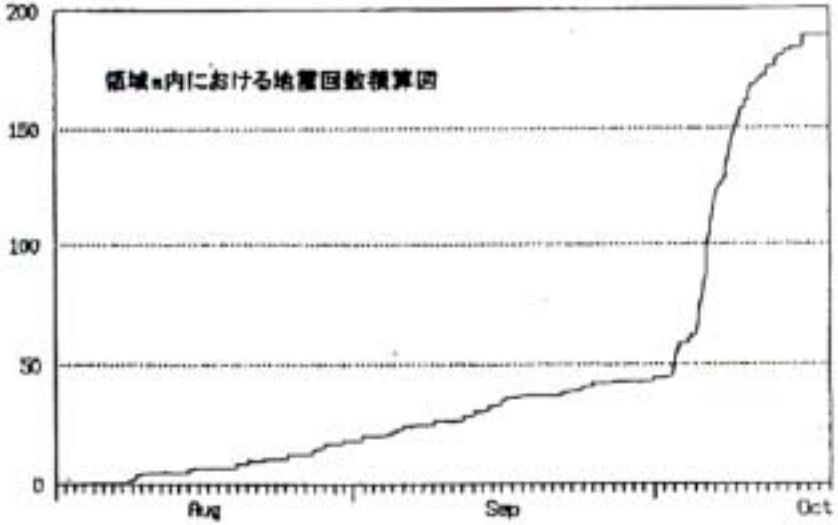
震央分布図　2002年8月1日～2002年10月17日

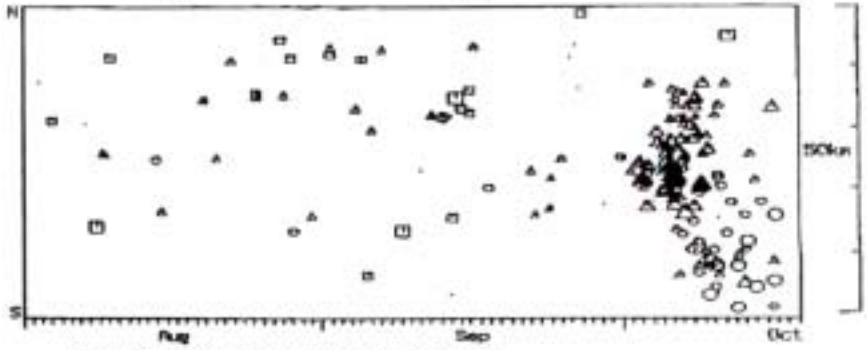


領域a内における深さの時系列図







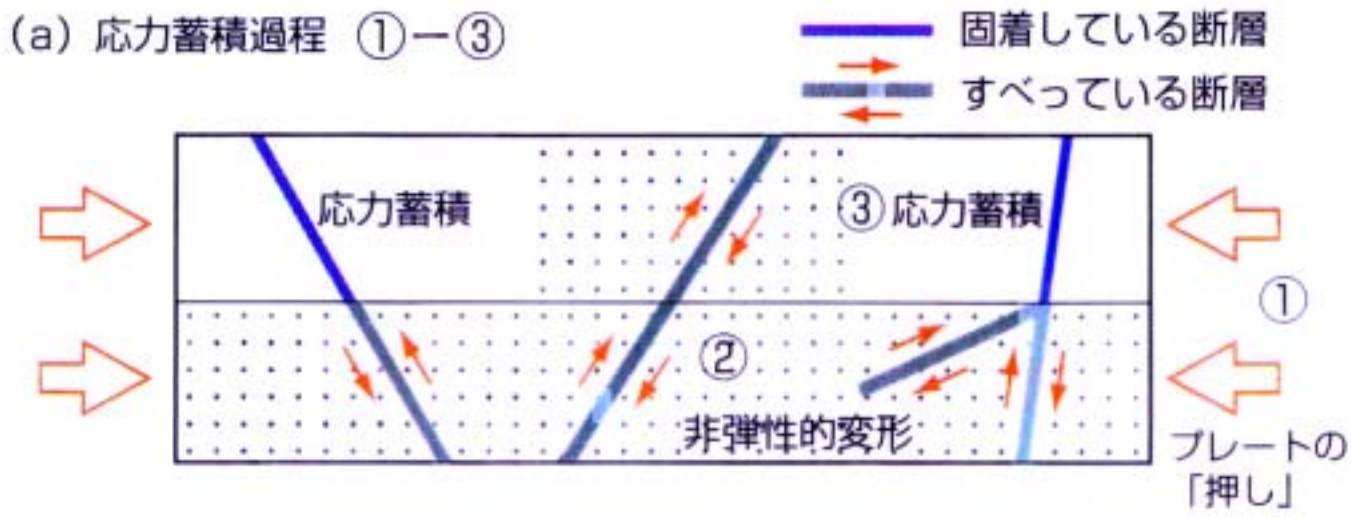


領域a内における時空間分布図(南北方向)

[JMA (2002)]

Old Program	*New Program*
Earthquake Precursors	
Experience-Based Search	Model-Based Search Modeling ⇔ Theory ↓ ↑ Monitoring ⇔ Observation
Observation	

本研究の仮説



従来のモデル