Japan Geoscience Union Meeting 2011
(May 22-27 2011 at Makuhari, Chiba, Japan)

HDS029-01 Room:302 Time:May 24 10:45-11:00

Geologic structure and rupture history of the south extension of the Kuromatsunai-Teichi Fault Zone by sonic survey

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INTRODUCTION

The Kuromatsunai-Teichi Fault Zone, meridionally traversing the basal part of Oshima Peninsula in south Hokkaido, reaches the northwestern coast of Uchiura Bay on the Pacific side. Along the coast, there are late Pleistocene marine terraces that are cumulatively tilting landwards. The landward tilting of the marine terraces suggests tectonic deformation due to offshore active faulting or folding. However, we have no precise geologic information on offshore active fault and fold. Under the circumstances, Active Fault and Earthquake Research Center, AIST and Geological Survey of Hokkaido, HRO have carried out a comprehensive survey of the northwestern coastal area of Uchiura Bay, as a part of the 2010 offshore active fault survey project funded by MEXT. The survey comprises high-resolution single and multichannel sonic surveys, ultra-high-resolution single-channel sonic survey and paleoseismological piston coring. In this presentation, we focus on the major results from the high-resolution single and multichannel sonic surveys using boomer source.

SONIC SURVEY LINES

Fig. 1 shows present survey lines. In Uchiura Bay, 5 to 6-km-wide scallop nurseries are densely disposed along the coast. Therefore, survey line deployment is restricted to 1) 1 to 2-km-wide narrow littoral zone in back of the scallop nurseries, 2) 5 to 6-km-long passages across the nursery zone, and 3) offshore area outside the nurseries. We conducted single channel profiling for survey lines within the scallop nursery zone and multichannel sonic prospecting for the offshore survey lines outside the nursery zone.

MAJOR RESULTS

1) Discovery of active anticlines

We have found two left-stepping anticlines with a 5 km interval near the coast of Oshamambe and off Kunnui, respectively. The anticline off Kunnui clearly upheaves the postglacial transgressive surface (Fig. 3), and is identified as an active fold. The anticline near Oshamambe is also judged to be an active fold on the basis of structural concordance with the backward (landward) tilting of the late Pleistocene marine terraces, even though upheaval of transgressive surface is not clearly observed.

2) Discovery of active faults

Two west-side-up active faults, partly showing monoclinal appearance, have been identified 1 to 3 km east of the above-mentioned two anticlines (Figs. 1, 2). Precise interpretation of the sonic profiles leads to a conclusion that the two active faults ruptured at least twice, at the early stage and the middle to late stage of the postglacial transgression (possibly between 13 and 5 ka).

3) Contribution to the evaluation of the Kuromatsunai-Teichi Fault Zone

The recognized southern end of this fault zone extends southwards for 10 km from the conventional fault tip, and the fault zone length will change from 32 km or longer to 42 km or more. The cumulative vertical displacement in the postglacial transgression stage is estimated, at the most, to be 4 m for the fault off Oshamambe, and 5 m for the fault off Kunnui. The vertical displacement per event might have attained 2 m at the maximum on the fault off Oshamanbe, and 2 to 3m on the fault off Kunnui. The recurrence interval of rupturing of the submarine faults is roughly estimated at several to seven thousand years.

REMAINING ISSUES

The western to southern coastal area of Uchiura Bay still remains a gap of geologic information, while the Yakumo Fault Zone and another active fault are known on the western and southern coasts of the bay, respectively. Therefore, it is necessary to conduct active fault survey for the western and southern coastal zones of Uchiura Bay in order to reveal the relationship between the Kuromatsunai-Teichi Fault Zone and the two faults.

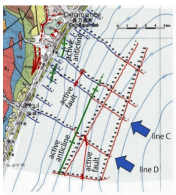

Fig. 1 Survey lines and newly found active structures.

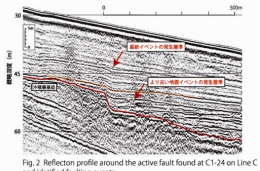

Fig. 2 Reflecton profile around the active fault found at C1-24 on Line C and idetified faulting events.

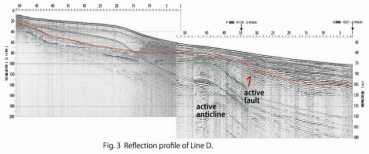

Fig. 3 Reflection profile of Line D.

Keywords: Kuromatunai-Teichi Fault Zone, active fault, active fold, sonic survey, Uchiura Bay, boomer

Japan Geoscience Union Meeting 2011
(May 22-27 2011 at Makuhari, Chiba, Japan)

HDS029-02 Room:302 Time:May 24 11:00-11:15

Offshore active fault survey ”Futagawa-Hinagu Fault Zone” -Outline and main survey results

Kyoko Kagohara[1*], Izumi Sakamoto[2], Yoshiyuki Takino[2], Naoto Inoue[3], Naoko Kitada[3], Tomoo Echigo[3]

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The 100-km-long Futagawa-Hinagu Fault zone distributed from piedmont of the Aso volcano to the Yatsushiro Sea. The southwestern extent of fault zone composed many NE-SW trending faults, mainly right-lateral strike-slip faults, in the Yatsushiro sea bottom. We conducted a combined survey of the Yatsushiro sea fault group, as a part of the 2010 offshore active fault survey project of MEXT. The survey comprises high-resolution multichannel sonic survey, ultra-high-resolution sonic survey and paleoseismological piston coring to clarify the fault-trace distribution, its activity and faulting history.

Keywords: Futagawa-Hinagu Fault Zone, Offshore, active fault, sonic survey, piston-core, strike-slip fault

Japan Geoscience Union Meeting 2011
(May 22-27 2011 at Makuhari, Chiba, Japan)

HDS029-03 Room:302 Time:May 24 11:15-11:30

Tectonic landforms and active structures of the Yokote Basin, northeast Japan

Mitsuhisa Watanabe[1*], Takashi Nakata[2], Yasuhiro Suzuki[3], Hideaki Goto[2], Hiroyuki Tsutsumi[4], Kaoru Taniguchi[5], Hiroshi Sawa[6]

[1]Toyo Univ., [2]Hiroshima Univ., [3]Nagoya Univ., [4]Kyoto Univ., [5]AIST, [6]Tsuruoka Nat.Col.Tech.

We found some deformed fluvial terraces in the eastern margin of the Yokote Basin on the basis of precise geomorphic interpretations using large scale aerial photographs. Newly mapped active faults in the northern part of the basin indicate that we should reexamine the trace of the surface ruptures associated with the 1896 Rikuu Earthquake and the active fault structures fringing the eastern margin of the basin. In the southern part of the basin, some dextral active faults are dominant. The characteristics of fault traces and gravity anomalies suggest a quite different picture from that of northern part for basin development. Careful geomorphic interpretations are very useful for reconstruction of more reliable long-term risk evaluation of earthquake. In order to understand the natures of tectonic development, geomorphic investigations are inevitable.

Keywords: fluvial terrace, fault topograph, active fault, fault structure, Yokote basin

Japan Geoscience Union Meeting 2011
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HDS029-04 Room:302 Time:May 24 11:30-11:45

Drilling survey across the active reverse fault zone along the eastern margin of the Yokote Basin, northern Japan

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The active reverse fault zone along the eastern margin of the Yokote Basin is one of the largest active thrust fault system in northern Japan. Taniguchi et al. (2007) carried out careful interpretation of large scale air photographs for more detailed mapping of active fault traces based on observation of minute tectonic landforms. Newly mapped fault traces in the southern part of the active reverse fault zone along the eastern margin of the Yokote Basin near Yokote city. The authors carried out drilling survey across northern end of this fault traces, in Akagawa town west of Yokote city. The active faults are expressed as west facing flexure scarp which is about 1 m high. Evidence of borehole stratigraphy indicates that the faults in study area displaced progressive after about 30ka.

Keywords: active fault zone along eastern margin of Yokote Basin, active fault, reverse fault, drilling survey

Japan Geoscience Union Meeting 2011
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HDS029-05 Room:302 Time:May 24 11:45-12:00

Relationship between landslides caused by 1556 M8.5 Huaxian earthquake and active faults in eastern Weihe Basin,China

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Earthquake-induced landslides have been reported in association with many moderate to large earthquakes, causing many casualties and large economic losses, which have been paid great attention to and widely investigated around the world (e.g., Harp and Jibson, 1996; Ren and Lin, 2010). Most earthquake-induced landslides are concentrated in the areas around the epicenter of large earthquakes over a distance of tens of kilometers. Recent studies reveal that there is close relation between the distribution and topographic features of earthquake-induced landslides along the co-seismic surface rupture zone, which is effected by the pre-existing active faults, e.g., the earthquake-induced landslides caused by the 2008 M_w 7.9 Wenchuan earthquake (Ren and Lin, 2010).

The locations of landslides can be identified by interpretations of Remote Sensing images and structural analysis of digital elevation model (DEM) data, which are controlled by the tectonic topography developed along the pre-existing active fault.

In this paper, we present case study of the earthquake-induced landslides caused by the 1556 M 8.5 Huaxian earthquake occurred in the Weihe Basin, central China. The Great Huaxian earthquake occurred on 23 January 1556 in the eastern Weihe Basin, central China, resulting more than 820,000 fatalities and widespread damage in the densely-populated region around the Xi'an city, an old capital of China.

We use high-resolution IKONOS and WorldView remote sensing images to identify the locations of landslides along the south margin of eastern Weihe Basin. Topographic analysis is conducted with 30-m resolution Advanced Spaceborne Thermal Emission and Reflection Radiometer (ASTER) Global Digital Elevation Model (GDEM). The results have been confirmed by the field investigations.

The landslides caused by the 1556 great Huaxian earthquake mostly occurred in the south margin of the eastern Weihe Basin where many active normal faults are developed. The landslides are mainly developed upon steep slopes (30-60^o) along the active normal fault zones within the margin zone between the Weihe Basin and Huashan Mountains. A cluster of landslides including the greatest landslide of $>$ 6 km^2 are developed along the Huashan Piedmont faults near the Huaxian city where is inferred as the epicentral area of 1556 M 8.5 earthquake. Based on the distribution of landslide and deformation features of active faults and disaster distributions recorded in the historical documents, it is inferred that the landslides are concentrated in the epicentral area of 1556 great earthquake.

Keywords: Landslides, Active faults, 1556 M 8.5 Huaxian earthquake, Eastern Weihe Basin, Central China

Japan Geoscience Union Meeting 2011
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HDS029-06 Room:302 Time:May 24 12:00-12:15

Distribution of active faults crossing highways in west Japan and some consideration of a countermeasure by bridge

toshiro Okamoto[1*], Takuya Kushida[1]

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abstract

Keywords: west Japan, highway, active fault, suspension bridge

Japan Geoscience Union Meeting 2011
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HDS029-07 Room:302 Time:May 24 12:15-12:30

Information of active fault traces for earthquake hazard reduction

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[1]Active Fault and Eq. Res. Ctr, AIST/GSJ

Numerous active fault maps were published in Japan. These maps show active fault trace lines in various scales. In large-scale maps, active fault traces are indicated precisely, however these lines do not show the location of source faults. Active fault maps in response to various purposes are needed for earthquake hazard reduction.

Keywords: active fault, map, information, scale, earthquake, hazard reduction

Japan Geoscience Union Meeting 2011
(May 22-27 2011 at Makuhari, Chiba, Japan)

HDS029-08 Room:302 Time:May 24 12:30-12:45

The First Photo Contest of Active Faults in Japan and its Implication in Mitigation of Earthquake Disaster

Isamu Toyokura[1*], Takashi Azuma[2], Yoko Ota[3], Atsumasa Okada[4], YUZO KATSURA[5], Jun Tajika[6], Takashi Nakata[7], AKIO HARADA[8], Minoru Hoshino[9], Takashi Hosoya[10], Tokihiko Matsuda[11], Sakae Mukoyama[12], Mitsuhisa Watanabe[13]

[1]Geotoyokura, [2]AFERC, AIST, [3]National Taiwan Univ., [4]Ritsumeikann Univ., [5]Agency for Cultural Affairs, [6]Geological Survey of Hokkaido, [7]ex-Hiroshima Univ., [8]Tokyo National Museum, [9]GIAJ, [10]Chuou Kaihatsu Corp., [11]ADEP, [12]Kokusai Kogyo Corp., [13]Toyo Univ.

The Japanese Society of Active Fault Resarch had carried out successfully the first photo contest of active faults in Japan last year. We will make a presentation of its result and its implication in mitigation of earthquake disaster due to active faults.

Keywords: Active fault, mitigation of earthquake disaster, photocontest, active fault 100, tectonic geomorphlogy, geopark

Japan Geoscience Union Meeting 2011
(May 22-27 2011 at Makuhari, Chiba, Japan)

HDS029-P01 Room:Convention Hall Time:May 25 16:15-18:45

Offshore active fault survey ”Futagawa-Hinagu Fault Zone”(1) Results of the High-resolution Multi-Channel Sonic survey

Kyoko Kagohara[1*], Takanobu Aiko[4], Ikuhisa Adachi[4], Izumi Sakamoto[3], Yoshiyuki Takino[3], Naoto Inoue[2], Naoko Kitada[2], Fumitoshi Murakami[1], Yukinobu Okamura[1]

[1]AFERC, AIST, [2]GRI, [3]Tokai Univ., [4]Daiwa Exploration & Consulting. co. ltd.

The 100-km-long Futagawa-Hinagu Fault zone is extending from piedmont of the Aso volcano to the Yatsushiro sea. The south-western extent of fault zone, composed by many NE-SW trending faults in the Yatsushiro sea bottom. We have conducted high-resolution shallow sonic survey using boomer source and 24-channel, 3.125-m-channel-interval streamer to clarify the precise fault-trace distribution, fault deformation features and displacement of the fault group in Yatsushiro sea. The acoustic profiles imaged several steep faults and the related narrow graben and folds.

Keywords: Futagawa-Hinagu Fault Zone, Offshore, active fault, strike-slip fault, Yatsushiro-sea

Japan Geoscience Union Meeting 2011
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HDS029-P02 Room:Convention Hall Time:May 25 16:15-18:45

Offshore active fault survey ”Futagawa-Hinagu fault group”(2) Result of high resolution geostratigraphic survey

Izumi Sakamoto[1*], Kenji Nemoto[1], Ryosuke Hirayama[1], Koya Sano[1], Yuka Sekine[1], Kouhei Saita[1], Yoshiyuki Takino[1], Mikio Fujimaki[2], Naoto Inoue[3], Naoko Kitada[3], Kyoko Kagohara[4]

[1]Dept. Marine Mineral Res., Tokai Uni., [2]Coastal Ocean Research, Co., [3]Geo Research Institute, [4]Geological Survey of Japan

Tokai University performed high-resolution geostratigraphic survey to confirm a formation, distribution, and displacement around the coastal area of the Ftagawa-Hinagu fault group. We use a parametric acoustic system that has 1) nallow beam with, 2) wide secondary frequencies, 3) high pulse repetition rate, and 4) high resolution technical characters.

The investigation sea area is located central part of Yatsushiro Sea. The Ftagawa-Hinagu fault presents the structure of the NE-SW direction in this area. We arranged parallelism and line of perpendicular 500m distances in the dislocation as reconnaissance survey. And we also arranged 25 to 50m-grid line for detailed survey. Total line reached 255km.

Acoustic stratigraphical character: We divided into 4 acoustic stratigraphical layer (L-1, L-2, L-3, and L-4) by the character of reflective surface and reflective formation. L-4 layer is an acoustic basement of this study area, and the top surface is characterized with a reflector full of unevenness. L-3 layer presents a clear reflection pattern in no layered bedding, and the top surface is a comparatively flush reflector. L-2 show excels of horizontally inside reflection and the top surface contacts unconformable relationship with the overlying L-1 layer. L-1 with no layered bedding exist the most upper part of this area.

Results: In the A area (which locates northern end of study area), the main fault develops on a straight line in succession in the NE - SW direction, but changes into a fault zone with graven structure in the northern end part. The drag fold structure (passed to 1,000m) was confirmed with the transcurrent fault, and also confirmed the dip of fold structure becomes gentle toward the northeast side.

The acoustic scattering layer was observed around the northeast part of study area. In this area, the acoustic scattering layer develops toward the northeast along the fault. It seems that we are connected with a development of acoustic scattering layer and a tomographic development.

As the detailed offshore high-resolution geostratigraphic survey with short wide grid line, some transcurrent faults structure such as drag fold structure and flower structure was successfully observed.

Keywords: Futagawa-Hinagu fault group, high resolution geostratigraphic survey, drag fold structure, acoustic scattering layer

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HDS029-P03 Room:Convention Hall Time:May 25 16:15-18:45

Offshore active fault survey ”Futagawa-Hinagu Fault Zone”(3) Result of piston-core sampling

Naoto Inoue[1*], Naoko Kitada[1], Tomoo Echigo[1], Takahiro Kubo[5], Akira Hayashida[2], Izumi Sakamoto[3], Kyoko Kagohara[4]

[1]Geo-Research Institute, [2]Doshisha University, [3]Tokai University, [4]Advanced Industrial Science and Tech., [5]Kawasaki Geological Engineering Co.,Ltd.

The Futagawa-Hinagu Fault Zone, traversing the Yatsushiro Sea in the NE-SW direction, extends from Mt. Aso to the Yatsushiro Sea. The offshore zones of the fault zone lack reliable information on termination of fault-trace, activity and faulting history. We have carried out a paleoseismological piston coring, as a part of the 2010 offshore active fault survey project funded by MEXT. The purpose of the investigation is to clarify the faulting history and activity (average slip rate) of the offshore fault zone.

The offshore fault zone of the Futagawa-Hinagu Fault Zone indicates the small-scale graben structure.

We decided the following 7 sites for piston coring, based on the results of high-resolution multichannel and ultra-high-resolution single-channel sonic surveys. We got the following 7 cores in the Yatsushiro Sea.

HG-1 (Core length : 6.52m)
Latitude / Longitude (WGS84) = 32:18:50 / 130:24:29
HG-2 (Core length : 6.75m)
Latitude / Longitude (WGS84) = 32:18:46 / 130:24:32
HG-3 (Core length : 2.59m)
Latitude / Longitude (WGS84) = 32:18:21 / 130:24:49
HG-4-2 (Core length : 1.96m)
Latitude / Longitude (WGS84) = 32:18:16 / 130:24:52
HG-7-2 (Core length : 4.65m)
Latitude / Longitude (WGS84) = 32:20:10 / 130:26:51
HG-8-2 (Core length : 14.34m)
Latitude / Longitude (WGS84) = 32:20:5 / 130:27:4
HG-9-2 (Core length : 8.16m)
Latitude / Longitude (WGS84) = 32:20:2 / 130:27:12

The piston cores of HG-7-2, HG-8-2 and HG-9-2 were obtained on both sides of the graben structure around the Shirakami-iwa where the Kumamoto Prefecture carried out the previous survey.

We are now carrying out various kinds of analyses and measurements, including facies, grain size, bulk density, magnetic susceptibility, soft X-ray, tephra and 14C dating. We intend to clarify faulting history and slip per event of each target fault.

Acknowledgement

We are thankful to the local government officers involved in Kumamoto Prefecture, and the staffs of a fishermen’s cooperative association.

Keywords: Offshore active fault survey, Futagawa-Hinagu Fault Zone, Yatsushiro Sea, Piston-core

Japan Geoscience Union Meeting 2011
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HDS029-P04 Room:Convention Hall Time:May 25 16:15-18:45

Offshore active fault survey ”Kurehayama Fault Zone” (2) -Results of the faulting history by arrayed borehole survey

Tomoo Echigo[1*], Masashi Omata[2], Yorihide Kohriya[2], Yoshiki Mori[2], Naoko Kitada[1], Naoto Inoue[1], Reiji Tanaka[1]

[1]Geo-research Institute, [2]CREARIA Co., Ltd.

The Kurehayama Fault Zone, traversing the Toyama Plain in the NE-SW direction, from Kurehayama Hills to Toyama Bay. The north part of Kurehayama Fault Zone, respectively, lack reliable information on fault-trace distribution, activity and faulting history. Under the circumstances, we decided the following two sites (Higashi Toyama, Higatae) for paleoseismological arrayed borehole survey, based on the results of analysis data from using aerial laser survey. This project is as a part of the 2010 offshore active fault survey project funded by MEXT. The purpose of the investigation is to clarify the faulting history and activity (average slip rate) of each fault zone.

The result is as follow.
<Higashi Toyama site>
This site is located that isolated from the main flow of the Jintsu River and Joganji River. We have carried out borehole survey at 6 points. Each depth are BHT-1:10m, BHT-1.5:6m, BHT-2:10m, BHT-3:10m, BHT-4:12m, BHT-5:12m (from west to east). We confirmed three kinds of units. The stratigraphy of each points are almost same. We interpreted to pass by the active fault between BHT-2 and BHT-3. All units are thought to have deformed by the active fault, however, we could not confirm the sediments which deposited after the latest event.
<Higatae site>
This site has been located in the backmarsh near Toyama Bay. We have carried out borehole survey at 3 points. Each depth are BHG-2:7m,BHG-1:7m,BHG-3:6m (from west to east).
In cross section, it was confirmed that the basal gravel layer is tilted to the east.
From the BHG-2 and BHG-1, have accumulated thick deposits of back marsh sediments. However, we could not confirm the sediments which deposited after the latest event.

We are now carrying out various kinds of analyses and measurements, including facies, tephra and 14C dating. We intend to clarify faulting history and slip per event of target fault.

Keywords: Offshore active fault survey, Kurehayama Fault Zone, Aerial laser survey, Arrayed borehole survey, Activity

Japan Geoscience Union Meeting 2011
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HDS029-P05 Room:Convention Hall Time:May 25 16:15-18:45

Ground penetrating radar profiling across the Sakamoto fault and Kumeda fault in the Uemachi fault zone

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We carried out 200MHz ground penetrating radar profiling to reveal the shallow (about 0-8m) subsurface structure across the Sakamoto fault and Kumeda fault in the Uemachi fault zone.

Keywords: acitive fault, reverse fault, ground penetrating radar, Uemachi fault, Osaka Plain

Japan Geoscience Union Meeting 2011
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HDS029-P06 Room:Convention Hall Time:May 25 16:15-18:45

Holocene activity of the Kuwana fault, Central Japan

Ryutaro Naruhashi[1*], Toshihiko Sugai[2]

[1]Graduate School of F. Sci., Univ. Tokyo, [2]Graduate School of F. Sci., Univ. Tokyo

In order to verify whether the periodicity in the activity of the active intraplate fault, we estimated the Holocene activity of the Kuwana fault based on the facies analysis and the 52 accelerator mass spectrometry (AMS) ^{14}C dates from drilling cores.

In Naruhashi et al. (2008) and Naruhashi et al. (2011), five vertical slip events during the 5,000 years (7,000 yrBP-2,000 yrBP) was detected by comparing changes in the depositional rates in cores from both the hanging wall and footwall of the fault (Altitudinal difference curve: ADC). Those ages of seismic events were approximately 6600 cal yBP, 5700 cal yBP, 4000 cal yBP, 3600 cal yBP, 2100 cal yBP, A.D.745, and A.D.1586. The recurrence interval of the large earthquakes produced by Kuwana fault was 1039 years in average, and the average slip rate of the fault during the last 7000 years was approximately 1mm/y represented by the inclination of regression lines of ADCs.

Two time-displacement diagrams were constructed based on the displacement and the age of seismic event that had been calculated from ADCs for two pairs of No.200-No.350 and No.275-No.350. It is uncertain whether diagrams of the Kuwana fault follow time-predictable model.

The regeneration process model was made using the cumulative distribution function based on estimated event ages. The accumulation frequency is approximated with lognormal distribution, and is different from exponential distribution (Poisson process). This indicates that the Kuwana fault does not generate large earthquake randomly, but rather repetitively.

Based on lognormal distribution, the standard deviation of recurrence intervals for the Kuwana fault is 477 years, the relative aperiodicity (value in which standard deviation is divided by mean value) was 0.46. It is less than 420 years from A.D.1586 year when the Kuwana fault faulted at the end, thus each probability of earthquake within 30, 50, and 100 years in the future became 7.5, 8.8, and 12.4% respectively.

Keywords: Kuwana fault, Holocene, displacement, recurrence model, reverse fault

Japan Geoscience Union Meeting 2011
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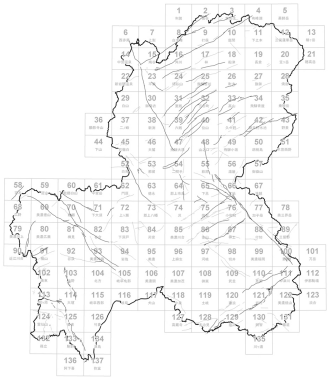
HDS029-P07 Room:Convention Hall Time:May 25 16:15-18:45

”1:25,000 Scale Active Fault Map of Gifu Prefecture” and its online release

Nobuhiko Sugito[1*], Yasuhiro Suzuki[1], Atsumasa Okada[2], Heitaro Kaneda[3], Masami Togo[4], Takashi Nakata[5], Daisuke Hirouchi[6], Mitsuhisa Watanabe[7], Chikara Uchida[8], Gifu Prefecture[9]

[1]Nagoya University, [2]Ritsumeikan University, [3]Chiba University, [4]Hosei University, [5]Hiroshima University, [6]Shinshu University, [7]Toyo University, [8]Tamano Consultants Co., Ltd., [9]None

We published ”1:25,000 Scale Active Fault Map of Gifu Prefecture” and its explanatory text in 2010, and released them online (http://www.gis.pref.gifu.jp/), in order to call attention of residents to seismic hazard. Each expert on active fault research interpreted airphotos of the entire area of the prefecture, based on the same standard as we provide ”1:25,000 Active Fault Map in Urban Area”. From the fall of 2009 to the summer of 2010, we held ten times of meetings (2-3 days for each meeting) to compile and cross-check opinions by each expert. The map shows detailed locations of the Atotsugawa, Miboro, and Nobi active fault system for the first time, which (probably) caused the great 1858 Hietsu, 1586 Tensho, and 1891 Nobi earthquakes, respectively, in addition to fault traces in the upper-reach area of the Nagara River, around Mt. Byobu, Mt. Ena, and so on. We also identified several previously-unknown active faults, and partly revised the traces of the previously-known active faults.



Keywords: active fault, tectonic landform, seismic hazard, disaster prevention, GIS, Gifu Prefecture