

# Japan Geoscience Union Meeting 2011

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HQR022-01

Room:201A

Time:May 24 14:15-14:30

## An experimental imaging of lateral facies change of unusual tsunami deposits on the Ground-Penetrating Radar profile und

Futoshi Nanayama<sup>1\*</sup>, Kiyoyuki Shigeno<sup>2</sup>, Satoshi Ishikawa<sup>3</sup>, Hideki Yoshikawa<sup>1</sup>, Kazuaki Watanabe<sup>1</sup>

<sup>1</sup>AIST, <sup>2</sup>Ibaraki University, <sup>3</sup>Kyushu University

Ground penetrating radar (GPR) is a geophysical profiling method based on propagation and reflection of electromagnetic waves. This method is recently used for geomorphological and geological survey under the marsh, because it is effective for the imaging of the shallow underground less than 10 m depth. In June 2008, the mega-trench excavated in the central part of Nanbuto marsh with the cooperation of Nishio (Construction Ltd.) in Nemuro, then we identified huge erosional surfaces with peat clasts and 16 layers of giant tsunami deposits in the peat bed was deposited on the past since 5500 years BP and tsunami stratigraphy was confirmed here. In November 2009, we observed lateral facies variation of giant tsunami deposits on the mega-trench wall (100m width) of Katsuragi quarry in the southwestern part of Nanbuto lowland with the cooperation of Daiichisangyo (Construction Ltd.). In November 2010, we set the ground penetrating radar survey lines on the top of mega-trench walls and tried to image the lateral sedimentary facies change of giant tsunami deposits. In this exploration, we used two GPR systems, pulseEKKO100 (200 MHz) and Noggin 250MHz produced by Sensors & Software Inc. The interval of observation of pulseEKKO100 was 0.25 m and its Noggin 250MHz was 0.05m, and the exploration depth was shallower than about 6m but we got high-resolution images (15-20cm). In our presentation, we show experimental imaging of sedimentary facies under the Nanbuto marsh in Nemuro lowland using our GPR method, and also we show GPR imaging is a good method to identify giant tsunami traces under the marsh.

Keywords: ground-penetrating-radar, marsh, unusual tsunami deposit, lateral facies change, experimental imaging, Nemuro lowland

HQR022-02

Room:201A

Time:May 24 14:30-14:45

## Developmental processes of Holocene barrier system based on borehole data for a case of Akkeshi bay area

Kiyoyuki Shigeno<sup>1\*</sup>, Hisao Ando<sup>1</sup>, Futoshi Nanayama<sup>2</sup>, Ryuta FURUKAWA<sup>2</sup>, Nobuhiro Kumasaki<sup>3</sup>, Tsumoru Sagayama<sup>4</sup>

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A Holocene barrier system is situated around Akkeshi-ko lagoon separated from Pacific Ocean by two sand-spits. There is a tidal inlet between lagoon and sea, and also a typical tide flood delta with modern oyster reef in the center of the lagoon. However, the developmental processes of the Akkeshi barrier system during the Holocene transgression have not well understood, because the postglacial sea-level research has stalled in this area since Maeda et al. (1992). In cooperation with the Hokkaido Regional Development Bureau and Akkeshi Town, we tried to compile Holocene borehole data from coastal lowland areas and also analyzed the offshore drilling cores taken in February 2009 and 2010 by using sedimentological methods, spectrometry measurement, grain size analysis, pH and EC measurements, radiocarbon dating and paleontological techniques. We were able to get some new knowledge about development processes of the barrier system.

A transgressive surface recognized at -50m below sea level around Akkeshi Bay estimated to have been formed about 11,000 years ago. Moreover, thick sandy deposits upper than the horizon of -16m below sea level suggest that barrier sand spit began to be formed about 7,000 years ago by longshore sediment transport around Akkeshi Bay. The tidal flat deltas was also generated during the establishment of this barrier system.

Keywords: eastern Hokkaido, Akkeshi bay area, Holocene, barrier system, sea level change

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HQR022-03

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Time:May 24 14:45-15:00

## Sedimentological study of the subsurface strata of the Kushiro Plain, northern Japan

Yasuhiro Takashimizu<sup>1\*</sup>, Yuichi Abe<sup>1</sup>, Shinaya Suzuki<sup>1</sup>, Chihiro Maruyama<sup>1</sup>

<sup>1</sup>Niigata University

To clarify the heterogeneity of the subsurface strata of the Kushiro Plain, the core samples were analyzed by sedimentological method (e.g. facies analysis, grain-size analysis, measurements of total sulfur, and measurements of electric conductivities of stirred muddy sediments)

Kushiro Group was inferred to be mainly composed of bay and delta sediments. In particular, the seaward part, the bay sediment consists of thick silt layers. On the other hands, the landward was interpreted as a fluvial dominated delta body. It was considered that progradation of the delta into the bay from upstream rivers.

"Chuseki-so" deposits which is an incised valley fills during post last glacial maximum period, is divided into three parts: seaward part, central part, and landward part. The seaward part consists of braided fluvial, meandering fluvial, salt marsh, drowned valley, central basin, flood tidal delta, and beach-shoreface deposits, in ascending order. The central part is composed of braided fluvial, meandering fluvial, salt marsh, drowned valley, central basin, mud flat, minor river channel and back marsh deposits, in ascending order. The landward part consists of swamp, minor river channel, and back marsh.

Keywords: Chuseki-so, Kushiro Group, Incised valleys

HQR022-04

Room:201A

Time:May 24 15:00-15:15

## Evaluation of the recent activity of Kakuda-Yahiko fault based on S-wave Land Streamer reflection survey and drill core

Tomio INAZAKI<sup>1\*</sup>, Yoshinori MIYACHI<sup>2</sup>, Atsushi Urabe<sup>3</sup>, Kyoko Kagohara<sup>2</sup>

<sup>1</sup>GSJ, AIST/PWRI, <sup>2</sup>GSJ, AIST, <sup>3</sup>RCNHDR, Niigata University

We have been conducting high-resolution S-wave seismic reflection surveying using Land Streamer at Akatsuka district, Niigata City. A 900-m long S-wave survey line had successfully detected off-fault deformation structure, but only a part of the main faulted zone was delineated due to short line length. We then extended the survey line to cover the main faulted zone, and added an additional 900-m long seismic line parallel to the previous line. A 75-m deep drilling survey was also appended on the line. Detailed sedimentological analysis and <sup>14</sup>C dating were applied to the drilled core. The purpose of the combined survey was to image on- and off-fault deformation structure in a flexure zone and to evaluate the recent activity of Kakuda-Yahiko Fault, which runs at the western margin of the Echigo plain.

As a result, CMP stacked migrated sections clearly profiled off-fault primary faultings as well as the major on-fault flexure structure at the near surface down to 150 m in depth. Correlation of seismic profiles with the drilled cores and logging data obtained at drill sites enabled to distinguish the recent paleoseismic events and to assess their ages and recurrence intervals. Slip rate for the delineated flexure zone was estimated about 1.4 mm/yr in a vertical component, but its fraction to the on-fault zone was at most 60 %. This indicates the conventional paleoseismic approach as typified by the combination of trenching and arrayed drilling is inadequate to understand the gross deformation of a faulted zone. In contrast, high-resolution seismic reflection surveying is capable to delineate on- and off-fault deformation structure in a faulted zone.

Keywords: concealed fault, Echigo Plain, Kakuda-Yahiko fault, Land Streamer, seismic reflection surveying, drill core analysis

HQR022-05

Room:201A

Time:May 24 15:15-15:30

## Accumulation curves of the incised-valley fills in the Echigo Plain, central Japan

Ayako Funabiki<sup>1\*</sup>, Yoshinori MIYACHI<sup>1</sup>, Katsumi Kimura<sup>1</sup>, Atsushi Urabe<sup>2</sup>, Yukihiro Kamoi<sup>3</sup>

<sup>1</sup>Geological Survey of Japan, AIST, <sup>2</sup>Research Center for Natural Hazards and, <sup>3</sup>Kowa Co. Ltd.

### 1.Introduction

The Echigo Plain faced on the Japan Sea coast is a sedimentary basin governed by subsiding effect of the Echigo Plain Western Margin Fault Zone. The incised valley under the Echigo Plain is filled with the sediment of the Shinano and Agano Rivers as the sea level rose during the last deglacial. The thickness of the sediment is up to 160 m. The plain is still interseismically subsiding at a rate of about 3mm/yr at the coast. In this study, we illustrated the accumulation curves based on the radiocarbon data of 27 boreholes taken from the Echigo Plain. Then, we discuss the sedimentary environment and accumulation rates.

### 2.Shinano River lowland

The Shinano River lowland consists of the western part of the Echigo plain, located on the downthrown side of the fault. In this area, the fluvial and marine sediments aggraded from the last glacial maximum to early Holocene. During this period, the accumulation curve of each borehole site documented similar trend. After 9 cal kyr BP, the barrier-lagoon system documented relatively high accumulation rates (average: 10mm) and prograded seaward with several times interation of transgression and regression.

The western edge of the plain consists of the uplifted side of the fault and the Kakuta-Yahiko Mt. The estuarine sediments covered the late Pleistocene sediments without fluvial sediments. They are located at -20 to -10 m in elevation and the accumulation rate is less than 2 mm/yr. The Kakuta-Yahiko Mt. leads to the Yotsugoya anticline on seafloor. The accumulation rate of the core taken from Yotsugoya anticline is about 2.5 mm/yr. It illustrates a gentle curve indicating less subsiding effect and distance from the depositional center.

### 3.Agano and Kaji River lowland

In the Agano River lowland, the eastern part of the plain, delta system has prograded since 8 cal kyr BP instead of the barrier-lagoon system. The accumulation rate of the delta sediments are about 8 mm/yr. The Agano River's incised valley was almost filled with the deltaic sediments by the middle Holocene, while the most of the Shinano River lowland remained inundated.

The northern part of the Echigo Plain consists of Kaji River lowland. In this area, the accumulation rates of the incised valley-fills are about 3 mm/yr and much smaller than the Shinano River and Agano River lowland. This is because the thick alluvial-fan related sediment deposited before Pleistocene filled sedimentary basin and limited the accommodation space.

Keywords: incised-valley fills, Echigo Plain, accumulation curve, maximum flooding surface, radiocarbon dates

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HQR022-06

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## Stratigraphy of the alluvial sediments in the Kashiwazaki Plain, Niigata Japan

Atsushi Urabe<sup>1\*</sup>

<sup>1</sup>NHDR, Niigata University

The alluvium sediments of the Kashiwazaki Plain in the Kashiwazaki City, Niigata Prefecture show maximum thicknesses about 50-60m. This sediment mainly consists of clay and silt, and thin sand layer. The stratigraphy has been divided into the lower part which mainly consists of clay and silt, the middle part which consists of the sand and upper part which consists of clay, silt and peaty sediment. However, it must examine in stratigraphy and sedimentation age, because there are no data such as tephra and <sup>14</sup>C dating. For the purpose of the elucidation of fundamental stratigraphy and facies of the alluvium, facies division and dating, etc. were carried out using boreholes. On the basis of the boring database, the basis landform of the alluvium was restored. As this result, the estimation of fundamental stratigraphy and in sedimentation's in the inland was possible. The sand dune develops in coast parallel of the Kashiwazaki urban area. It was confirmed that Yasuda Formation (Pleistocene) is distributed under the dune sand sediment by the borehole. Along present coastal dune, it became clear that the Yasuda Formation showed the narrow mound landform. By this landform, the distribution of the marine sediments was narrow area in the inland. The alluvium in the Kashiwazaki Plain were deposited by estuary system in which the sea invades from the narrow inlet and progradation of the river system.

Keywords: Alluvial sediment, Stratigraphy, Kashiwazaki Plain, Niigata

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HQR022-07

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## Sedimentary facies and environments of the latest Pleistocene to Holocene core (GS-KSO-1) in the Arakawa Lowland

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<sup>1</sup>AIST/GSJ, <sup>2</sup>Fukuoka University

Sedimentary environments in a sediment core GS-KSO-1 (Kawagoe City, Saitama Prefecture) are reconstructed based on sedimentary facies analysis and radiocarbon dating.

The Arakawa Lowland, where GS-KSO-1 was taken, is a long and narrow alluvial plain, about 5 km wide, located between the Musashino and Omiya highlands. It is a branch of the Tokyo Lowland. The Tonegawa River, which is a largest drainage in the Kanto Plain, was passing through the other branch Nakagawa Lowland into the Tokyo Bay before the artificial rerouting of a stream in Edo era. However, it had been passed through the Arakawa Lowland until 4000 years ago (Kikuchi, 1981 Urban Kubota; Hirai, 1983, Geographical Review of Japan). Due to a large amount of sediment supply during most time of a post glacial sea-level rise, valley fills in the Arakawa Lowland is supposed to be sandier than the Nakagawa Lowland.

GS-KSO-1 is located near the upstream end of sea water incursion during the Jomon Highstand, so that it may provide important information about the reconstruction of valley fill processes. Sedimentary facies analysis and radiocarbon dating reveal that the paleo-coastline reached the most inland of the Arakawa Lowland around 8000 years ago. It does not agree with the peak of relative sea level curve in the area around the Tokyo Bay, possibly due to a large amount of sediment supply into the lowland that prevented the transgression.

Keywords: Arakawa Lowland, latest Pleistocene to Holocene, boring core, sedimentary facies, Jomon Transgression, Kawagoe City

HQR022-08

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Time:May 24 16:00-16:15

## Visualization of river geometry using borehole database: an example of incised valley fills under the Arakawa Lowland

Yoshiro Ishihara<sup>1\*</sup>, Junko Komatsubara<sup>2</sup>, Shiori Fukuoka<sup>1</sup>, Katsumi Kimura<sup>2</sup>

<sup>1</sup>Fukuoka University, <sup>2</sup>AIST/GSJ

Relatively sandy incised-valley fills deposited during the latest Pleistocene to Holocene distribute under the Arakawa Lowland, central Japan. These coarse deposits, mainly composed of transgressive river sediments are formed by the Paleo-Tonegawa River, now located in the Nakagawa Lowland. Sedimentary facies, radiocarbon ages, and some geochemical properties of those incised valley fills in the Arakawa Lowland have been revealed by the Urban Geological Survey Project of Geological Survey of Japan. The incised valley fills have thick wedge-shaped gravel-rich river sediments deposited in the lowstand stage, thick sand-dominated river sediments deposited in the transgressive stage, muddy delta-plain and delta-front sediments fills an inner-bay in the highstand stage, and thick salt-marsh deposits draping delta-plain sand in the head of the bay in ascending order. In this study, we attempt to visualize the river deposits using the borehole database of the Urban Geological Survey Project. The visualization is based on the evaluation of the sandy-river deposits of 3D-geological models using the borehole database. Visualized transgressive-river sand body shows an accumulative and weakly meandering sand-ribbon confined in the basement, reflecting the transgressive river geometry.

Keywords: Arakawa Lowland, 3D-geological model, sand ribbon, sandy river, incised valley fill



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HQR022-P01

Room:Convention Hall

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## Basal geometry and internal structure of incised-valley fills, the Chuseki-so in Ishikari Lowland by Borehole Database

Wataru Hirose<sup>1\*</sup>, Gentaro Kawakami<sup>1</sup>, Sunao Ohtsu<sup>1</sup>, Katsumi Kimura<sup>2</sup>

<sup>1</sup>Geol. Surv. Hokkaido, HRO, <sup>2</sup>Geol. Surv. Japan

Alluvium Sequence in Ishikari Lowland is interpreted by 3D Geological model constructed by BoreHole Database.

Keywords: alluvium, BoreHole Database

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HQR022-P02

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## Correlation of the alluvium bed on and off shore area of the Echigo Plain

Yoshinori MIYACHI<sup>1\*</sup>, Atsushi Urabe<sup>2</sup>, Ayako Funabiki<sup>1</sup>, Kyoko Kagohara<sup>1</sup>, Takahiko INOUE<sup>1</sup>, Atsuko Amano<sup>1</sup>, Yukinobu Okamura<sup>1</sup>

<sup>1</sup>Geological Survey of Japan, AIST, <sup>2</sup>Niigata Univ.

We recognized to clarifying the alluvium beds in the Echigo Plain based on 1. analyzed sedimentary facies analysis of 8 drilling core samples (on and off shore area), 2. about 10,000 borehole log data, 3. 9 tremor array measurement and 4. high resolution seismic survey (on and off shore area). We correlate the on and off shore alluvium beds by the transgression after the last glacial age and high-stand of sea level respectively. 6 cross sections across the Echigo Plain and basement countour map of the alluvium beds in and around the Echigo Plain.

Alluvium beds tilt west northern part and western part of the Echigo Plain. Central part of the Echigo Plain, Vast sediments from old Shinanogawa river and Aganogawa river filled incised valley transgression after the last glacial age (16kyr BP ? 9kyr BP). barrier ? lagoon system develop in the Echigo Plain when high-stand of sea level(after 9kyr BP).

We can correlate the alluvium beds, but problem won through up to the depth conversion.

Keywords: Echigo Plain, Chuseki so, Niigata, Quaternary, Kakuta- Yahiko Fault

HQR022-P03

Room:Convention Hall

Time:May 24 10:30-13:00

## Stratigraphy and geologic structure of the Quaternary sediments in the Noda District (Quadrangle Series, 1:50,000)

Tsutomu Nakazawa<sup>1\*</sup>, Susumu Tanabe<sup>1</sup>

<sup>1</sup>Geological Survey of Japan, AIST

We discuss the basic stratigraphy and the geologic structure of the Quaternary successions of the Noda district, central Japan, on the basis of the geologic map "Noda" of the Quadrangle Series, 1:50,000, published by the Geological Survey of Japan, AIST. The Noda district is situated within the central part of the Kanto Sedimentary Basin and is underlain by thick Cenozoic successions. In the shallower part of the subsurface, the Lower to Middle Pleistocene Kazusa Group, Middle to Upper Pleistocene Shimosa Group, younger terrace deposits, Kanto Loam, and Alluvium are distributed.

**Kazusa Group:** The Lower to Middle Pleistocene Kazusa Group generally occurs in the subsurface deeper than an elevation approximately ?100m. The boundary between this group and the overlying Shimosa Group is defined by the base of the Jizodo Formation corresponding to MIS 12. The Kazusa Group comprises depositional cycles of non-marine and marine sediments in the Noda district, but its stratigraphic framework has not been established.

**Shimosa Group:** The Middle to Upper Pleistocene Shimosa Group which is distributed in the subsurface shallower than an elevation approximately ?100m in the Noda district is divided into 6 formations and a bed; they are the Jizodo, Yabu, Kamiizumi, Kiyokawa, Kioroshi, and Omiya formations and the Joso Clay in ascending order. Of them, the Omiya Formation is composed of fluvial sand and mud, and the Joso Clay consists of taffaceous clay, while each of other formations comprises a depositional cycle of non-marine and marine deposits. The widespread marker tephra layers such as TE-5, Km2, Km4, Ky3, KIP are intercalated. These tephra layers indicate that the depositional cycles of the Shimosa Group correspond to the sea-level fluctuations at MIS 12-5.3 of the Middle to Upper Pleistocene.

**Late Pleistocene terrace deposits and Kanto Loam:** The terrace deposits (Ohorigawa terrace deposits) younger than the Shimosa Group occur along the Ohori-gawa River, Kashiwa City in the southeastern part of the Noda district. These deposits comprise muddy sand which accumulated at MIS 5.2-5.1. The Younger Loam (Kanto Loam) bed is composed largely of brownish volcanic ash soil. The loam bed in the Noda district intercalate marker tephra layers of Hk-TP and AT.

**Alluvium:** The Alluvium in the Nakagawa Lowland, which distributes shallower than ?50 m, can be divided into A, B, C and D units in ascending order. The Alluvium in the Tonegawa Lowland, which distributes shallower than ?25 m, can be divided into A, C and D units in ascending order. The Alluvium in the small valley dissecting the upland thickens less than 5 m and it mostly consists of D unit.

The A unit distributes at about ?50 m and ?25 m in the Nakagawa and Tonegawa Lowlands, respectively. It mainly consists of braided river gravel. The B unit distributes at about ?50 to ?30 m in the Nakagawa Lowland and it primarily consists of sand?mud alternation without shells or burrows. This deposit can be interpreted as meandering river sediments. The C unit in the Nakagawa and Tonegawa Lowlands distributes at about ?35 to ?5 m, and it mostly consists of mud with abundant shells and burrows. The living habitats of shells show a deepening-upward and then shallowing-upward facies succession. Therefore this unit is interpreted as estuary and delta sediments. The D unit in the Nakagawa and Tonegawa Lowlands distributes shallower than ?5 m. The D unit consists of fining-upward sand without shells or burrows and artificial soil, in ascending order. The fining-upward sand is interpreted as modern fluvial sediments.

**Geologic structure:** The Middle to Upper Pleistocene and Holocene successions are almost horizontally distributed in the Noda district. However, a more detailed examination reveals that the successions slightly incline toward the northwestern part of the district with gentle undulations. The inclination decreases upward. No active fault is known in this district.

Keywords: Kanto Plain, Noda district, Shimosa Group, Alluvium, Pleistocene, Holocene

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## Petrographic properties of Middle Pleistocene tephra layers in the central part of the Kanto Plain

Kentaro Sakata<sup>1\*</sup>, Tsutomu Nakazawa<sup>1</sup>, Hiroomi Nakazato<sup>2</sup>

<sup>1</sup>GSJ,AIST, <sup>2</sup>NIRE,NARO

The basic stratigraphy of the Pleistocene Kazusa and Shimosa groups beneath the central part of the Kanto Plain has been well documented, but there are very few studies on tephrochronology. We examined petrographic properties of tephra layers intercalated in Middle Pleistocene sediment cores from Koshigaya and Yashio and in the coeval outcrop of volcanic ash soil on the Odamaki Hill, Saitama Prefecture, central Japan. Examined petrographic properties include grain size, mineral composition, and refractive index of volcanic glass, hornblende, and orthopyroxene.

Our detailed examination reveals that the sediment cores intercalate three well-known, widespread tephtras such as TE-5, Kh6, and Ks11. We also found seven potential marker tephtras such as YS2-S3, YS2-S4, YS2-S6, YS2-S7, YS3-S11, and YS3-S13 in the Yashio core and OD1 on the Odamaki Hill, which mostly exhibit peculiar refractive indices. In addition, a stratigraphic interval intercalating abundant hornblende-type tephtras even similar to each other can be regarded as a useful tephtra zone for stratal correlation.

Keywords: tephrochronology, Pleistocene, Kazusa Group, Shimosa Group

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## Sedimentary environment of Holocene deposit in the Osaka Plain and stratigraphy-Next agenda-

Naoko Kitada<sup>1\*</sup>, Naoto Inoue<sup>1</sup>, Keiji Takemura<sup>2</sup>, Muneki Mitamura<sup>3</sup>

<sup>1</sup>Geo-research Institute, <sup>2</sup>Kyoto Univ., <sup>3</sup>Osaka City Univ.

In Osaka Plain, Pliocene to Quaternary sediment Osaka Group and terrace sediment are deposited. These are covered with Holocene deposit at the lower plain and around Osaka bay area. These deposits include fifteenth layers of marine clay; refer to Ma-1, Ma0, and Ma1 to Ma13. Geological study indicates that these alternating clay layers are deposited due to glacial and interglacial cycle. Ma12 and Ma13 are Late Pleistocene and Holocene sediment respectively and are distributed near surface. Geo-database Information Committee of Kansai Area has developed the geotechnical database around Kansai Area. For the development of the geo-database, urban area has been focused because of its social and economical importance.

The relationship between marine clay and sea level change are described in Yoshikawa and Mitamura (1999). Although each marine clay layers are correlate to marine isotope stage, it is not enough to describe every isotope stage because of the stratigraphy data produced on the Osaka plain not to the center of Osaka basin. In 2006, The KIX18-1 was drilled at KIX 2nd runway from surface to the granitic basement rock of the Osaka sedimentary basin, which is the Quaternary sedimentary basin. The borehole has reached the basement at the depth of 1328m. There are several boreholes, which have reached to the basement in the Osaka basin. Most boreholes were drilled around active faults at northern part of the Osaka basin after the 1995 Kobe Earthquake. In contrast, there is no active structure around the KIX18-1. Thus, the KIX18-1 provides the non-tectonic paleoenvironment. The purpose of the KIX18-1 borehole was to evaluate effects of consolidation and to construct the geologic stratigraphy at the southern part of the Osaka basin. The upper part of the KIX18-1 was mainly geotechnically investigated. The detailed stratigraphy was constructed based on the tephrostratigraphy and paleo-magnetostratigraphy of the KIX18-1. Abundant various data, such as the result of soil testing, locations of soil testing, soil color, core image photograph and so on, were gathered. These data was archived as digital database. In the presentation, we would like to show the archived database. Moreover, as the application of the database, we show the result of the image processing of core images. The result of these researches, marine clay layer fined more than the present study.

Using borehole database, we can understand the spreading the marine layer. On the near by the active fault, these marine layer are vending or disappeared. Subsurface research was carried out around Uemachi Fault. The result indicates the flexure zone come to clear around fault. This zone is important estimate the behavior at the earthquake motion.

In this poster, we describe this study and report the next agenda.

Keywords: borehole, Osaka Group, sedimentary environment, KIX18-1, sea level change, deformation

HQR022-P06

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## Evolution of sedimentary environments associated with relative sea-level change in Toyooka Basin, Hyogo Prefecture

Koichiro Tanigawa<sup>1\*</sup>, Masayuki Hyodo<sup>2</sup>, Hiroshi Sato<sup>3</sup>

<sup>1</sup>Earth and Planetary Sciences, Kobe univ., <sup>2</sup>Kobe Univ. R. C. Inland Seas, <sup>3</sup>Inst. Nat. Environ. Sci., Univ. Hyogo

The latest Pleistocene to Holocene incised-valley fills are a good archive of paleoenvironment. Incised-valley fills have high sedimentation rates of several tens to hundreds cm/ka, which are much higher than those of deep sea and lake sediments. Therefore, they have a potential to provide a high resolution paleoenvironment record. In addition, the incised-valley fills have a merit that sediments are easily dated by <sup>14</sup>C dating. Moreover, marine sediments accumulated during transgression record the development of sedimentary environments associated with the relative sea-level change. In recent years, there is a study that showed the early Holocene sea-level jump that was indirectly indicated by the retreat of bay head delta (Rodriguez et al., 2010).

In this study, we aim to reveal the development of the sedimentary environment associated with relative sea-level change in the Toyooka Basin. About 200 borehole cores from the Holocene incised-valley fills in the basin were analyzed for this purpose. The thickness of the sediments is ca. 60 m at maximum. We performed analyses of diatom assemblage, sedimentary sulfur and tephra, and <sup>14</sup>C dating.

The incised-valley fills in the Toyooka Basin consists of the braided river sediments, floodplain sediments, the bay head delta and tidal flat sediments, the prodelta sediments, the delta front to delta plain sediments, and the floodplain sediments in ascending order.

The sediments below the prodelta one have been accumulated during transgression, while those above it have been accumulated during regression. The aggradation was dominated during transgression, while the progradation was dominated during regression. The sedimentation rate has changed by the development of sedimentary environment, with the highest rate in delta sediments during regression. The transgression reached to the site of the southernmost core in the Toyooka Basin at ca. 7,900 cal BP. In this core, the marine facies changed to the freshwater facies before ca. 7,300 cal BP. In the Toyooka Basin, the relative sea-level rise rapidly decelerated at ca. 7,900 cal BP, but still continued to ca. 6,600 cal BP. Thus the regression started coincided with the deceleration, despite the persistence of sea-level rise. As described above, these changes of sedimentary environment are closely related to the relative sea-level change.

**Keywords:** the latest Pleistocene to Holocene incised-valley fills, relative sea-level change, sedimentary environment, Toyooka Basin

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## Sedimentary facies and radiocarbon ages of GS-OGG core, from Noogata Plain, Fukuoka Prefecture

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We analyzed sedimentary facies and radiocarbon dates of the GS-OGG cores, obtained from the Noogata Plain, Fukuoka Prefecture. The Noogata Plain distributes along the Onga River, and is composed of the Quaternary deposits, those thickness is about 50m. The cores, GS-OGG-1 and GS-OGG-2 cores, drilled by the AIST/GSJ include deposits as follows. The GS-OGG-1 core is composed of the Paleogene basements, gravelly-river deposits, muddy tidal-flat deposits, sandy tidal-flat deposits, lagoonal deposits, salt-marsh deposits, and crevasse-splay/flood plain deposits in ascending order. The GS-OGG-2 core is drilled at the level of sandy tidal-flat deposits in the GS-OGG-1 core. The sedimentary facies are composed of the Paleogene basements, river-mouth bar deposits, lagoonal deposits, debris-flow deposits/gravelly-river deposits, and sandy tidal-flat deposits in ascending order. The lagoonal deposits of the GS-OGG-2 core are thought to be marine deposits of the last interglacial period, based on the radiocarbon date from the upper gravelly-river deposits. The muddy tidal-flat deposits to the crevasse-splay/flood plain deposits in the GS-OGG-1 core have the radiocarbon ages of 8620 y BP to 910 y BP. The lagoonal deposits of the GS-OGG-1 is gradually transition to the deposits of salt-marsh, and overlain by the crevasse-splay/flood plain deposits without erosions by the river channel. They are not contradict to the fact that the main channel of the Onga River was distributed along the western or easter side of the plain, and many flood events were filling the plain.

Keywords: Noogata Plain, Sedimentary facies, Radiocarbon date, Quaternary, Lagoon, Onga River