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

HQR022-P01 Room:Convention Hall Time:May 24 10:30-13:00

Basal geometory and internal structure of incesed-valley fills, the Chuseki-so in Ishikari Lowland by Borehole Database

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

Keywords: alluvium, BoreHole Database

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

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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

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

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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, KlP 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 gavel. 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

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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 tephras such as TE-5, Kh6, and Ks11. We also found seven potential marker tephras 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 tephras even similar to each other can be regarded as a useful tephra 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-

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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 geotechniclally 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

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

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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 14C 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 environmental 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 14C 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 are 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