

Field report:

Vycheгда river (Komi region) and Dvina
river (Arkhangelsk region)

NW Russia 2006



Section Nidz, River Lochim

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Introduction

This report contains our field data from the river Vychegda (Komi region) and the river Dvina (Arkhangelsk region) in NW Russia collected during the period June 5 – July 07 2006. The report purposes to provide the other field-participants with our field data and is a documentation of our contribution to the GlaciPet-project field-work in 2006. As we worked together as a group the whole period, the descriptions from the sites given by Maria Jensen (in her field report) and Igor Demidov must be considered to get the complete descriptions and evaluations of the investigated sites. In this report Eilivs field notes June 05-24 is merged into Astrids notes for the same period. For June 25-July 07 Eilivs notes in here is a supplement for Marias notes in her field report.

The main objectives of the field-work were to study glaciolacustrine, fluvial and marine sediments distally to the ice limit of the last glaciation.

Directional measurements in the report are not corrected for deviation from true north.

Trondheim 18.04.2007

Astrid Lyså

Eiliv Larsen

Participants

Geologists:

Eiliv Larsen (project leader), Geological Survey of Norway, Trondheim

Igor Demidov, Russian Academy of Science, Petrozavodsk

Maria Jensen, Geological Survey of Norway, Trondheim

Astrid Lyså, Geological Survey of Norway, Trondheim

Support personell:

Arthur Iljinsky (field assistant from Petrozavodsk)

Jevgenij (driver from Kotlas)

Field work in Russia 0506 - 0707 2006 - overview

050606: Departure from Trondheim 06:15. Arrival St. Petersburg 13:50 where Igor met us in the airport. Accommodation at hotel Moscow.

060606: St. Petersburg. We visited VSEGEI (Aleksei Matiushkov, Anna Shapirova, Ljudmila, Geological Research Institute), Geological museum, Zoological museum and finally ballet in the evening.

070606: Departure from St.Petersburg by train to Kotlas 09:40. We met Arthur Iljinsky at the railway station.

080606: Arrival Kotlas 09:45 where we met our driver with his car. In Kotlas we bought food and some equipments before we started the long drive-trip eastwards. Our intention was to shortly visit all the sites we had planned to work at before we made the final plans for the detailed work. Accommodation at hotel in Ordoma where we arrived at 19:30.

090606: Reconnaissance sites 06001, 06002, 06003 and 06004 before we ended in Aikino (20:00) where we rented a house for the night in Aikino.

100606: Reconnaissance sites 06005, 06006 and 06007. Heavy rain this day. Accommodation in University hotel, Syktyvkar.

110606: Reconnaissance sites 06008 and 06009. We were happy to rent a classroom in the children school in Ust Nem until 170606. Worked at site 06010.

120606: Continued work at site 06010.

130606: Continued work at site 06010. Work at sites 06009 and 06011.

140606: Work at sites 06012 and 06013.

150606: Work at site 06008.

160606: Work at sites 06014.

170606: We left Ust Nem for this time. Work at sites 06015, 06016, 06017, 06018 and 06019. Accommodation in tents at Ust Lochim until 200606.

180606: Work at site 06020.

190606: Work at site 06021.

200606: We left Ust Lochim and drove to Syktyvkar where we had lunch, bought food and tubes for luminescence. We drove to a field station at Ljali belonging to the Komi Academy of Science, forestry dept., where we slept in tents until 230606.

210606: Work at sites 06006 and 06022.

220606: Work at site 06004.

230606: Work at sites 06007 and 060023. In the morning we left the field station at Ljali and drove back to Syktyvkar in the evening for accommodation in hotel.

240606: We left Syktyvkar in the morning and drove directly to Kotlas where we arrived at 17:00. Astrid left Kotlas 21:50 by train to St. Petersburg and the rest of the group stayed in Kotlas at hotel Sovjetskaya and continued the field work along sections on Dvina.

250606: Astrid arrived St. Petersburg 21:35 after a long and warm night and day on the train. Alexej and his wife met Astrid at the railway station and followed her to hotel Moscow.

The rest of the group: Bying provisions, a.o. luminescence tubes, in the morning in Kotlas. Drove towards Krasnoborsk. Checked two sections on Dvina on either side of Krasnoborsk. Put up tents in a grass field at Artjukovskaya south of Krasnoborsk. Stayed there till 030706.

260606: Astrid left hotel Moscow 11:00 to the airport in St. Petersburg and arrived Trondheim ca. 18:00.

The rest of the group: Practical arrangements in and around Krasnoborsk. In the afternoon we went to check out the big section in a meander bend further north.

270606: Work at site 06024.

280606: Continued work at site 06024.

290606: Work at site 06025.

300606: Work at site 06026

010706: Continued work at site 06025

020706: Sites 06027A and B, 06028A and B, 06029

030706: Broke camp and left for Kotlas. Packing of luggage etc. Stayed in hotel Sovjetskaya.

040706: Kotlas – Veliki Ustyug – Kotlas. Sent samples to Petrozavodsk, and visited the town Veliki Ustyug.

050706: Kotlas – St. Petersburg, train.

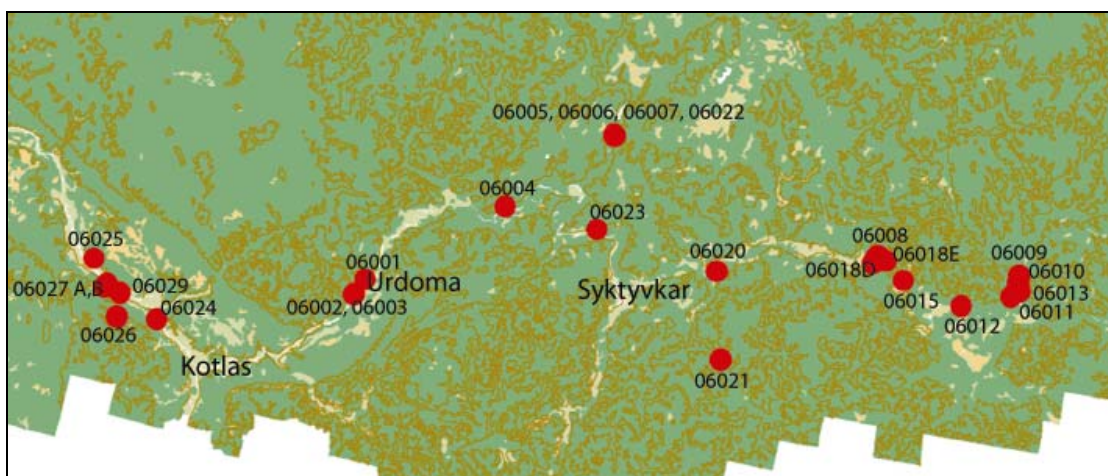
060706: Arrival in St. Petersburg. Stayed in hotel Moscow.

070706: St. Petersburg – Trondheim

List of sites

Site No	Site name	UTM	Note	Date visited
06001	Slobodochikovo	39 V 354859 6847660		0906
06002	Soyga	39 V 348313 6839539		0906
06003	Ryabovo	39 V 348314 6839540		0906
06004	Gam-1	39 V 430047 6887216		0906, 2206
06005	Kultovka	39 V 488814 6924890		1006
06006	Kultovka	39 V 489127 6925210		1006, 2106
06007	Kultovka	39 V 488928 6925974		1006, 2306
06008	Oz`jak	39 V 627439 6855865		1106, 1506
06009	M`joldino	40 V 389221 6845069		1106
06010	Kuryador	40 V 388606 6840933		1206, 1306
06011	Quarry on the main road from Ust Nem to Kuryador and M`joldino	40 V 388418 6837145		1306
06012	Shar`jak	40 V 357254 6831799		1406
06013	Road section close to pontoon bridge across river Nem	40 V 383923 6834640		1406
06014	Yl`janovo	39 V 632139 6857422		1606
06015	Gravel pit along the main road between Ust Kulom and Oz`jak	39 V 644248 6846742		1706
06016	Small section in deep ravine along the main road (across the road at Yl`janovo monastery)	39V 6635193 6857419		1706
06017	Terrace behind Oz`jak section	39 V 629583 6859747		1706
06018 A	Profile across the Oz`jak terrace	39 V 630988 6859801	transverse terrace profile	1706
06018 B	Profile across the Oz`jak terrace	39 V 630238 6860122	transverse terrace profile	1706
06018 C (= 06017)	Profile across the Oz`jak terrace	39 V 629579 6859699	transverse terrace profile	1706
06018 D	Profile across the Oz`jak terrace	39 V 628121 6856159	transverse terrace profile	1706
06018 E (= 06008)	Profile across the Oz`jak terrace	39 V 628154 6856056	transverse terrace profile	1706
06019	Small section along the main road just below hill with loc. 06018A	39 V 630829 6859852		1706
06020	Nidz, River Lokchim	39 V 543538 6851889		1806
06021	Lokchim	39 V 546005 6804500		1906
06022 (=06006)	Kultovka	39 V 489596 6925212		2106
06023	Charsovo	39 V 479565 6874739		2306
06024	Ust Kanza	38 V 562544 6817640		2506, 2706, 2806
06025	Tolokonka	38 V 525972 6846573		2506, 2906, 0107
06026	Ljabla River	38 V 540082 6817077		3006
06027a	Second terrace level outside Permagore, 110 m a.s.l.	38 V 532624 6831997		0207
06027b	section between terraces outside Permagore, 100 m a.s.l.	38 V 532729 6832271		0207
06028	Permagore	38 V 534128 6834172		0207
06029	Lapunovo	38 V 541485 6829628		0207

Location of investigated sites in the Komi and Arkhangelsk region –2006



Field notes

Monday 05.06 – Travel

Maria, Astrid, Igor, Eiliv

Maria, Eiliv and Astrid left Trondheim at 06:15 and flew to St. Petersburg via Oslo where we arrived at 13:50 local time. Met Igor in the airport in St. Petersburg. He had arranged cars and we and the luggage were transported to the hotel Moscow. The rest of the day was used to bank business, sightseeing and dinner. We also discussed the strategy for the field-work after the information Igor had about the area and decided to drive to the easternmost part of the field area and start there. On the trip we would shortly visit all potential sites to get an overview of their potential, importance and eventually how long time it would be suggested to use for work at the sites.

Tuesday 06.06 – St. Petersburg

Maria, Astrid, Igor, Eiliv

Visited the zoological museum (with famous mammoths) in the morning. Igor, Eiliv, Maria and Astrid visited VSEGEI (Geological Research Institute) where we met Alexej Matiushkov, Ljudmila Semenova (Head of Department of the geology and natural resources of western region Russia), and Anna Sharapova (marine geol., pollen. Has worked with Hald, Geøsfjeld). Received copies of Barents Sea maps. After the meeting we were shown the geological museum. After dinner Eiliv, Maria and Astrid went to ballet in the evening (Swan Lake). We also shopped food for the train-trip.

Wednesday 07.06 – Travel to Kotlas

Maria, Astrid, Igor, Eiliv, Arthur, Jevgenij

At the railway station in St. Petersburg we met our field assistant Arthur Iljinsky. We left St. Petersburg 09:35 by train to Kotlas.

Photos ELA:

090606/5-6

Thursday 08.06 – Arrival Kotlas. Drove to Urdoma.

Maria, Astrid, Igor, Eiliv, Arthur, Jevgenij

We arrived Kotlas 09:45 where we were met by our driver, Jevgenij, and his car. We spent some hours in Kotlas for shopping food and equipment. We started on the long driving-trip eastward and arrived Urdoma at 19:30 where we got nice new hotel for the night. Dinner at the hotel, cooked by Arthur who showed up to be a perfect cook both for this meal and the rest of the meals this field season.

Friday 09.06 – Driving eastwards – field work starts
Maria, Astrid, Igor, Eiliv, Arthur, Jevgenij

Car ferry across river Vychehda.

Site 06001 (Slobodochikovo) (UTM 354859 6847660)

Ravine section behind the church in village Slobodochikovo, on the right bank of Vychehda. The section is about 30 m high and is heavily covered by vegetation. The top level by the church is about 90 m a.s.l., terrace level about 80 m a.s.l. and the Vychehda river level 53 m a.s.l. Sections along the right bank of Vychehda are here less steep than the ravine section and are also covered by vegetation.

Along the river bank is stratified sandy sediments and about 1/3 up in the section shell fragments appear. These were sampled. Scars in the river section make it possible to clean the upper 2-3 meters of the section

We decide not to spend more time at this locality this day. Much time and digging would be necessary.

Samples:

C14 06-100

Photos (AL):

0906-1

0906-2

Photos (ELa):

090606/7-18

Site 06002 (Soyga) (UTM 348313 6839539)

River section at the right bank of Vychehda. Slumped sediments and vegetation cover the about 25-30 m high section. The upper 2-3 meters of the section show fine-grained (very fine sand) stratified/laminated sediments above a boulder-bearing layer. The fine-grained sand may be of lacustrine origin.

Maria and Igor dig at a lower level in the section (*cf.* photo AL0906-5) and find a diamict in which the lower boundary not is excavated. The diamict is fine-grained, contains clay and has a dark greyish colour. Thickness > 3 m, and the upper boundary is a "lag" containing many boulders and few gravel clasts. This "lag" appears as a horizon along the section separating the diamict from the topmost stratified sediments. Below this diamict, slumped diamict and sorted sand appear alternating. Perhaps deglacial diamicton showing slumping into basin.

We decide not to revisit this site this season unless we have much time left to spend.

We can see several sections between the villages Slobodchikova and Ryabovo.

Photos (AL):

0906-4 - 0906-6

Site 06003 Ryabovo (UTM 348314 6839540)

The site is a ca. 25 m high river section along the right bank of Vycheгда (close to the boat place at the village Ryabovo). A thick, very dark greyish diamict appears below a sandy unit in which is overlain by reddish diamict, probably the Saalian till? Maria and Eiliv make the most detailed description from this site.

Saw the similar (same?) dark diamict on as in 06003 overlain by reddish (Saalian?) diamict. The older may be Dniepr.

The section can be cleaned up, but we do not find it relevant for our work at this time.

Photos (AL):

0906-7 - 0906-9

Site 06004 (Gam-1) (UTM 430047 6887216)

The "Gam- terrace" is here a large and clearly marked terrace-level (about 80 m a.s.l.). The back-edge has a well-defined slope up to higher levels. This level is probably the 100-110 meters terrace level described by Lavrov.

Several small sections appear towards/along the river Vycheгда in this area. As estimated from the river bank, stratified fine-grained silt and sandy sediments appear in section at right bank of the river.

We conclude that this site should be revisited for detailed work (see below, 22.06).

At the end of the day we found a house for the night in the village Aikino (at 20:00).

Photos (AL):

0906-13 - 0906-17

*Saturday 10.06 –Field work – Aikino-Syktyvkar
Maria, Astrid, Igor, Eiliv, Arthur, Jevgenij*

We leave village Aikino in the morning and continue the driving eastwards.

Site 06005 (Kultovka) (UTM 488814 6924890)

Section along a small tributary river, the key section named Kyltovka by Lavrov. We are not quite sure that the section we find is exactly the same as the one described by Lavrov. He has described a 13 m high river section, but this one is only about 10 meters high. The sediments are described as lacustrine-fluvial sediments belonging to terrace-level 120 m a.s.l.

The trip to the section is a long walk in the wood and could be described as bathing in perspiration, mosquitoes and other terrible insects.

We conclude that we should come back to this area to look after the section in which Lavrov has described as a key-locality.

Photos (AL):

1006-2 - 1006-3

Photo (Ela):

100606-2

Site 06006 (Kultovka) (UTM 489127 6925210)

We are still at the same small tributary river, close and downstream to site 06005, at the right bank. Sections here seem to be higher than at site 06005 and probably also more easy to clean.

Photos (AL):

1006-4 - 1006-7

Photos (Ela):

100606/3-4

Site 06007 (Kultovka) (UTM 488928 6925974)

Sections in abandon sand quarry close to the road. It is possible to work in details in many sections, at least the upper 2-3 meters. It looks like mainly well-sorted sandy sediments, in places stratified, maybe coversands.

We decide to come back to this site.

Photos (AL):

1006-8 - 1006-10

Photo (ELa):

100606/5

Heavy rainfall today. We arrive Syktyvkar about 18:00 and Igor finds a "university" hotel for the night. In the evening we had a walk in Syktyvkar with Igor as a guide.

Photos (ELa):

100606/6-10

*Sunday 11.06 –Field work –Syktyvkar-Ust Nem
Maria, Astrid, Igor, Eiliv, Arthur, Jevgenij*

Site 06008 (Oz`jag) (UTM 627439 6855865)

By the village Oz`jag we find a ca. 15 m high river section at the right bank of Vychegda. The village lies at the 120 m terrace level. The section is possible to clean up and sorted sand appears. We decide to come back to this site.

Photos (AL):

1106-1 - 1106-2

Photos (Ela):

110606-1

From the village YI`janovo we observe river sections further downstream. We decide to visit and work in these sections later.

Photos (AL):

1106-5

Photos (Ela):

110606/2-5

The next stop is the village Sher`jag and we observe a river section downstream Vychegda that would be interesting to visit. The section has been described by Lavrov. Possibly Dniepr till with fluvial and lacustrine above.

Photos (AL):

1106-8 - 1106-9

Photos (Ela):

110606-6

Site 06009 (Mjoldino) (UTM 389221 6845069)

10-12 m high section through a terrace-slope, situated at the road side. River Vychegda is on the other side of the road. The section is oriented normal to the terrace-slope. When standing on the top of the slope, the terrain is flat (terrace-level). The uppermost 2-3 m of the section is possible to clean (sorted sand), and Igor finds gravel at lower levels in the section. We decide to come back to this site and spend about half a day.

Photos (AL):

1106-10 to 1106-13

Photos (Ela):

110606/7-8

Astrid resets the time on camera (AL) to Russian time, i.e. + 4 hours !!!

We drive to Ust Nem where we are lucky to rent classroom no. 6 and the kitchen at the primary school.

Photos (AL):

1106-14 – 1106-22 (village and school, Ust Nem)

Photos (Ela):

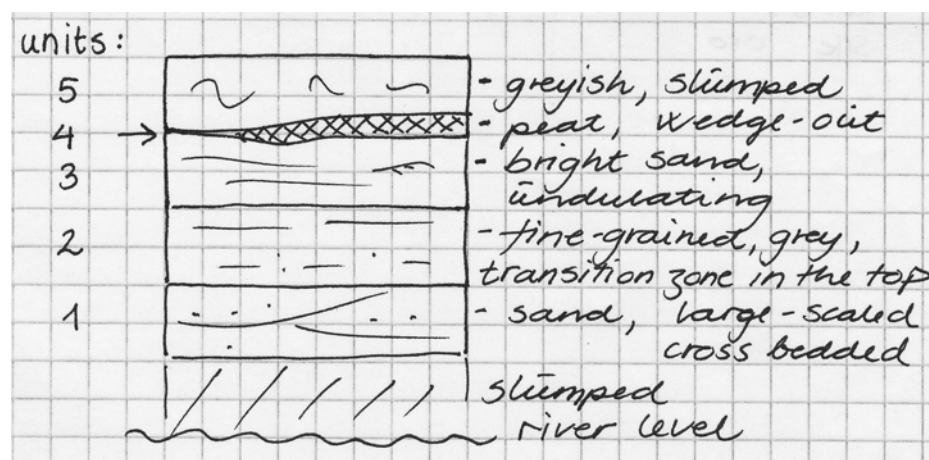
110606/9-14

Monday 12.06 –Field work –Ust Nem
Maria, Astrid, Igor, Eiliv, Arthur, Jevgenij

Site 06010 (Kuryador) (UTM 388606 6840933)

GPS zero point at the eastern end of the river section, right bank of Vycheгда. We have to walk about 20 minutes from the car to reach the section. To avoid ox-bow lakes we took the path to the left. The river section lies by the outer, concave, right bank of Vycheгда, oriented 30°-210° (downstream-upstream). Rivel level 109 m a.s.l. The site has been described by Lavrov.

We decide to start 180 m upstreams from the zero point and have a discussion about the main units in the section and agree on the following:



Preliminary units:

5: Gray, fine-grained, slumped

4: Peat

3: Light, planar laminated sand with thin peat stringers at base

2: Gray, clayey with transition to brownish planar laminated

1: Light sand

The following levels are measured:

-boundary between units 1 and 2 is 2.55 m a.r.l.

-boundary between units 2 and 3 is 4.85 m a.r.l.

-boundary between units 3 and 4 is 5.60 m a.r.l.

-boundary between units 4 and 5 is 5.70 m a.r.l.

-boundary between units 5 and 6 is 11.9 m a.r.l.

-top terrace 13.1 m a.r.l.

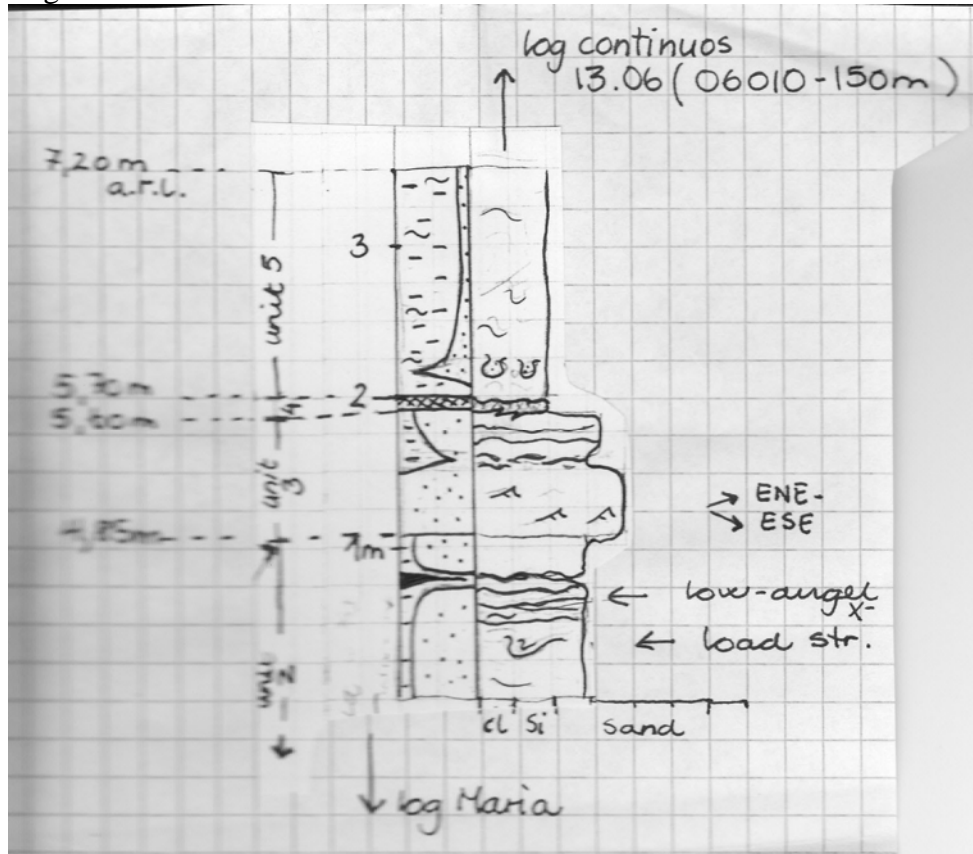


site 06010 (overview - section)
Polaroid is taken from the zero point towards the section (cf. photos AL1203-3 –6)

Section 06010 – 180 m

Maria describes unit 1. Astrid describes upper part of unit 2 and units 3-4-5. This part of the section lies about 7 m downstream for the part Maria describes.

Log 06010-180 m:



Detailed description (06010-180 m):

-Upper part of unit 2:

In the lower part, v.f. sand dominates and lamina and structures are diffuse. Upwards, fine sand dominates and lamina become more well-defined and appear to be more continuous. Laminae are in v.f. in few places m. sand fractions.

Load structures and low-angle erosional surfaces appear. A discontinuous, undulating 3-10 cm thick silty clayey (blue-grey) horizon/bed appear in the middle part, and load structures are found associated with this bed. In the uppermost part, the sand becomes more massive, and weakly less distinct and thicker lamina and small normal faults appear.

Unit 3:

Sharp lower boundary in which organic remnants (peat?) appear, remnants also appear in places ca. 5 cm down into unit 2. The lower part of unit 3 is ripple-laminated fine to medium sand (v.f. sand also occurs). The ripples are mainly eroded. In the lowermost part, small normal faults appear. Above the ripple-laminated part of

the unit, a horizon with undulating, discontinuous (crude) silty lamina lies below undulating, continuously laminated (horizontal, lenticular) fine sand. Current directions measured on the current ripples: towards ESE-ENE (100°, 95°, 100°, 120°, 120°, 60°)

Unit 4:

Gyttja, some peat. The unit is about 10 cm thick, the thickness varies but is continuous in the cleaned section. The lower boundary is sharp, uneven showing flame-structures and has a sheared impression. There are indications of lateral and vertical movements along the boundary. Water escape structures from the underlying sand appear into unit 4 (found further upstream at the place where Maria describes unit 1). Eiliv samples plant remains from the unit.

Unit 5:

Chaotic unit dominated by silt, but contains also clay and vf. sand. Ball and pillow structures and stretched lenses of sand appear at the lowermost part, but other "slump and load" structures appear throughout the unit. Upwards in the unit, chaotic changes and deformation appear in where silty beds, clayey silt and sandy silt appear with the following structures: slumping, load-structures, water escape structures and low-angle normal faults. Small "spots" of dark organic-like sediments appear in the sediment of unit 5. The lower boundary to the gyttja (unit 4) is not clear as the gyttja also appear as broken pieces up into the lower part of unit 5.

Unit 6:

The transition to unit 6 is gradual. It is not described from this part of the site as it is difficult to reach this part of the section.

Samples:

06-200 - 211

Photos (AL):

1206-3 - 1206-60

Photos (Ela)

120606/1-10

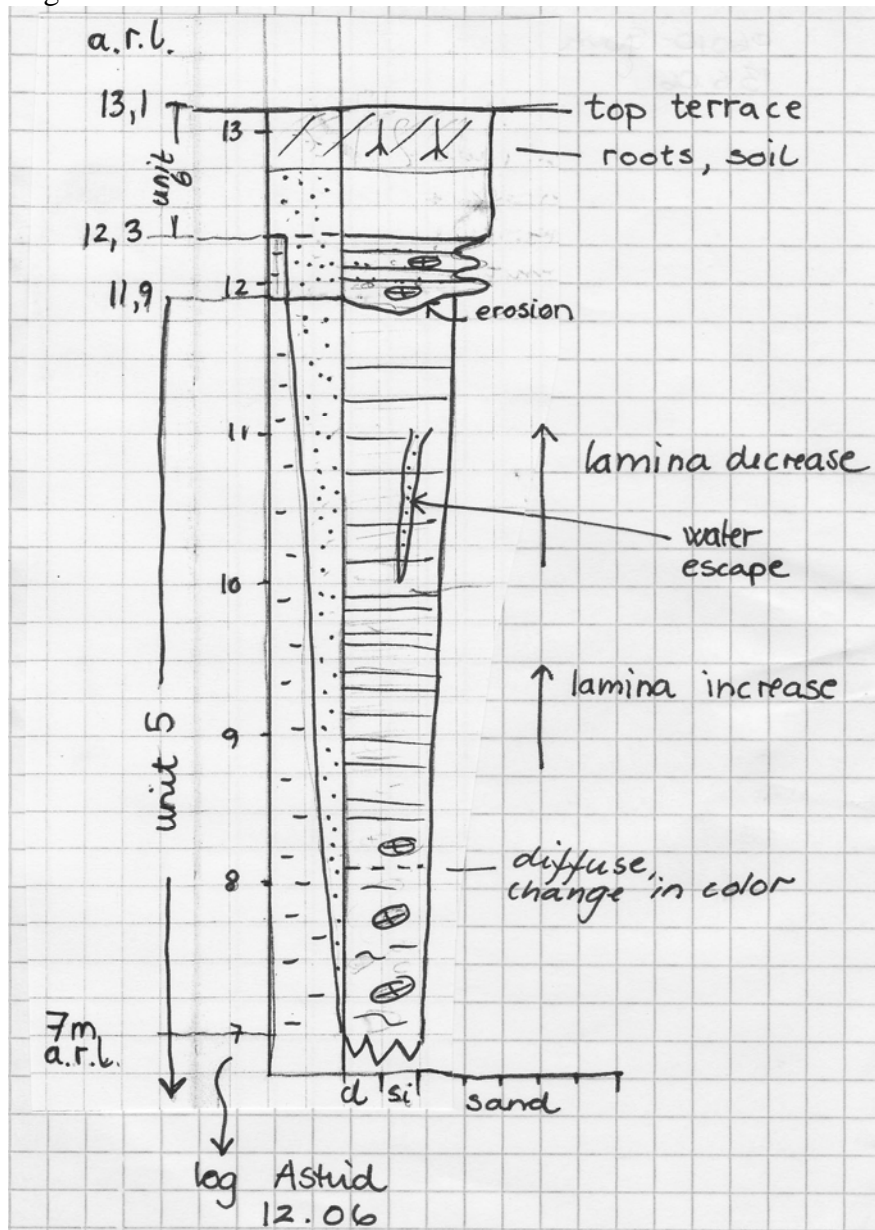
120606/11-13

Tuesday 13.06 –Field work –Ost Nem
Maria, Astrid, Igor, Eiliv, Arthur, Jevgenij

We continue the work at site 06010 and start the day with a discussion about the lower part of the section where Maria has described unit 2. Unit 2 has a very sharp lower boundary towards the underlying fluvial sediments (sediments deposited in fluvial main channel system). Unit 2 is silty, diffuse laminated and characterized by internal deformation, upwards it becomes more sandy (cf. log from site 06010-180 m, Astrid).

Section 06010 – 150 m

Log 06010-150 m:



Detailed description (06010-150 m):
Maria has a better and more detailed log!

Unit 5:

In the lower part patches, spots and zones of variable grain size (clayey silt, silt and sandy silt) appear in a disorganized pattern. Intraclasts of clay are common and the appearance of these decreases upwards and disappears around the level in which the sediment change colour from greyish to reddish. Here clayey lamina and v.f. sand lamina appear and increase in frequencies upwards before lamina decrease in frequencies at levels around 10 m a.r.l. The laminae are characterized by small internal deformations and show often a cracked, fissured pattern. A large wedge of sand indicating water escape occurs between 10-11 m a.r.l. Many details of the structures in unit 5 are documented by photos (AL).

Toward the top of the unit, there is a bed that shows erosional channel contact towards the underlying very fine, laminated sand. This part is laminated, contains somewhat coarser (fine) sand with small intraclasts (up to 2 mm) of clay (originated from underlying clay lamina). Some of these intraclasts have coarse to very coarse sand-size and are found concentrated in lamina. Elements of bright well-sorted fine sand might be of eolian origin, transported into the shallow channels.

Some comments regarding interpretation of unit 5 done in the field:

The lower part of unit 5 as described from 06010-180m shows a development from drowning of peat/gyttja to rapidly deposited lake sediments (load structures, synsedimentary deformation, internal deformation by slumping/sliding). Upwards the lake seems to be better established: rhytmities exist, sand content increases. These structures have later been deformed, likely as a result of (rapid) draining of the lake (high pore water pressure within the sandy lamina, water escape) and caused cracking and fissuring of the clay lamina. This is supported by the "large" sand wedge/ water escape structure found in the unit. Towards the top, shallow channels have existed and eroded into the laminated lake sediments (intraclasts of clay) and some eolian sand have been transported into these channels.

Unit 6:

Bright, fine sand. < 70 cm thick unit. Root horizons and soil cause the unit to be difficult to describe see primary structures and may have destroyed primary structures. It is not possible to sample for luminescence.

Samples:

06-212 – 213

Photos (AL):

1306-2 – 1306-7

Photos (ELa):

130606/1-10

We finish site 06010 and continue to site 06009 after lunch.

Site 06009 (Mjoldino) (UTM 389221 6845069)

We start to work at this site in which first was visited 11.06.06 (see above). The section is oriented 70° - 250° , normal to the terrace-slope.

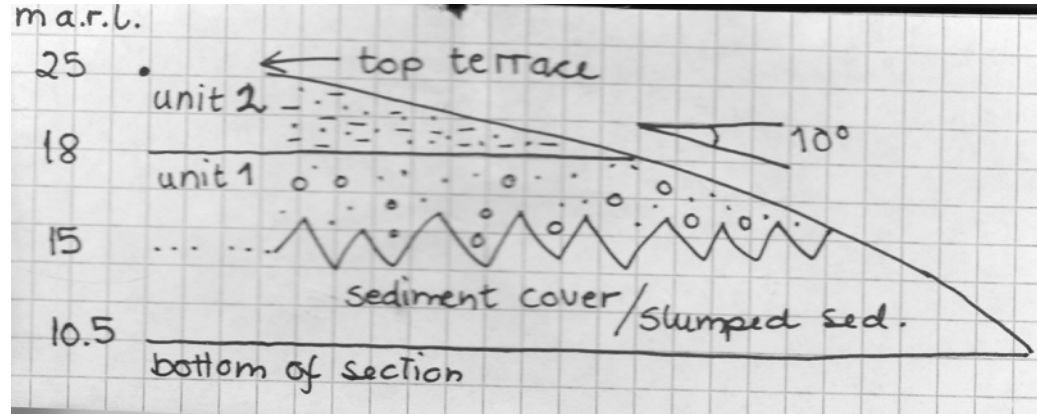
Eiliv levels the altitudes from the river Vychegda (= 109 m a.s.l.) (on the other side of the road):

Top of the terrace: 25 m a.r.l. (135 m a.s.l.)

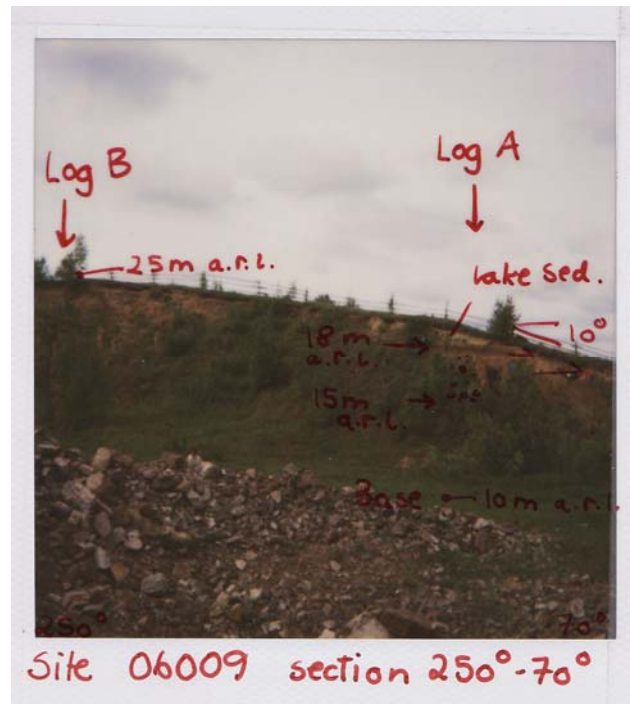
Top of the lake sediments: 18 m a.r.l.

Bottom of the section: 10.5 m a.r.l. We are not able to dig deeper than 15 m a.r.l. in to sandy gravel, but these sediments likely continuous down to the bottom.

Sketch of site 06009:



Polaroid 06009:



Descriptions of the units:

Unit 1:

Sandy gravel alternating with gravely sand. Boulders appear in the lower part. In general there is a fining upwards in which the boulders and coarse gravel fraction disappear.

Unit 2:

Lake sediments very similar to those described from site 06010. The lower boundary is sharp, mainly horizontal but slightly undulating (relief about 5 cm). Although the boundary is sharp, there is a transitional zone from the upper part of unit 1 into the lower part of unit 2: The gravels in the silty sediment disappear upwards the lower part of unit 2. Thickness of unit 2 is 6-7 m. We do not find indication of eolian sediments at the top of the section.

Comments on the terrace-form:

The terrace form is likely erosive and may represent a still-stand during the general draining of a lake. Ravines cut normal to the terrace form. The lake level must have been higher due to the appearance of the 6-7 m thick unit of fine-grained lake sediments on the top. The top-level of the terrace is not horizontal.

Samples:

06-214 – 215

Photos (AL):

1306-29 – 1306-37

Photos (ELa):

130606/11-20

Site 06011 (Quarry on the main road from Ust Nem to Kuryador and M'joldino (UTM 388418 6837145))

Section by the road. Bedrock is exposed. Lake sediments fill into depressions of the bedrock and appear up to the terrace level described from site 06009. In places gravely sediments are found above the bedrock.

About 30 m towards SE we find (dig out) the boundary between lake sediments and bedrock indicating lake sediments with local clasts. Only a few non-local clasts occur. The clasts are stratified and in places imbricated. At this site, the lake sediments have thickness up to 7 m.

Photos (AL):

1306-38 – 1306-42

Photos (ELa):

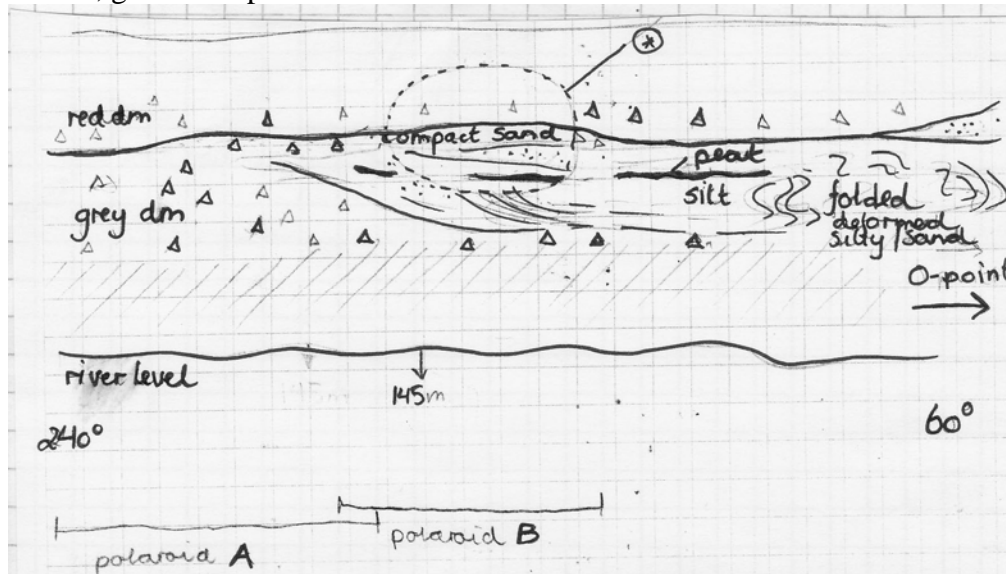
130606/21-22

Wednesday 14.06 –Field work –Sher`yak
Maria, Astrid, Igor, Eiliv, Arthur, Jevgenij

Site 06012 (Shar`jag) (UTM 357254 6831799)

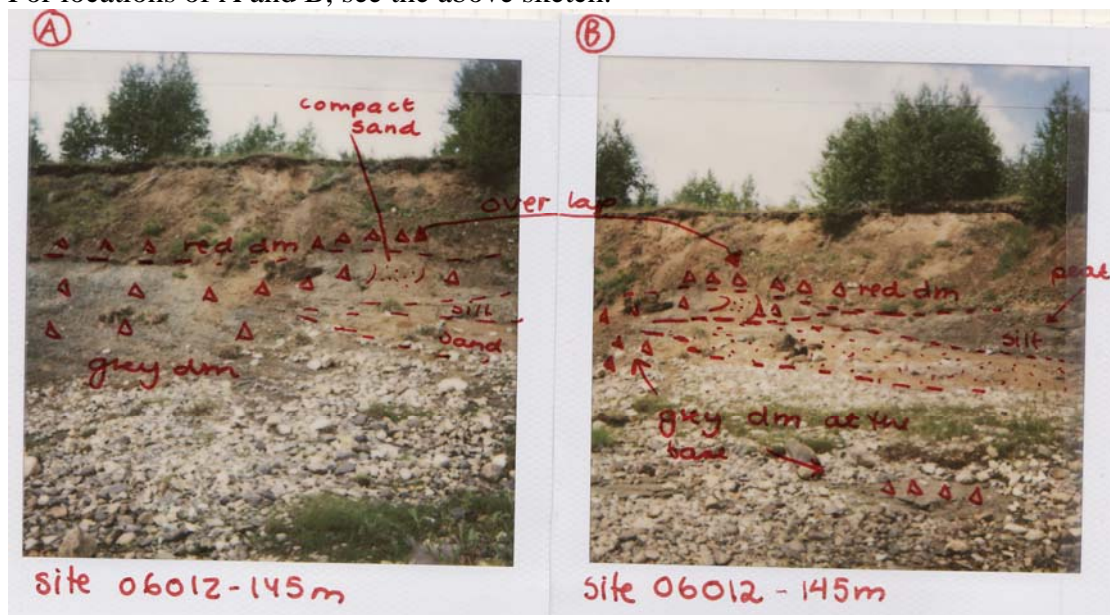
8 m high river section, right bank of Vychedga. The section is orientated 240°-60°, facing SE. 0-point at NNE end of section.

Sketch, general impression of the section:



Polaroid site 06012-145 m:

For locations of A and B, see the above sketch.



The section at 50 m from the 0-point is c. 4,6 m high. The top most 40 cm are disturbed by human activity. 0,40-1,40 m below the surface: Reddish brown, loosely compacted, sandy diamicton. Could be a deglacial/proglacial lake sediment. 1,40-2,40 m below surface: Reddish brown, medium compacted, sandy diamicton. A little finer than above. Some intraclasts of underlying sand. Sheared out sand in the lower part of the diamicton. Upper part of sand also sheared. Eastern sense of shear. Interpreted as active shear boundary and the diamicton as subglacial till. The sand below lacks clear primary structures. Contain large clasts of silt. The till is probably Moscovian. Comments on the compact sand (see * on the sketch above, cf. also the polaroid photos):

Polaroid, 06012-50m:



Below the red diamict at 50 m from zero-point we find a compact sandy bed that **also appears at 145 m**. This sand is clearly incorporated into the unit of the grey diamict. The red diamict is interpreted as a till and is likely the Saalian till (Moscow till). A well striated stone (280-100⁰) was locked in underlying sand. The lower boundary of the diamicton is knife-sharp at this site. Obviously erosive as diamicton truncates large water-escape structures.

We finish this site and conclude that this site represents "old" stratigraphy: Dnieper till (grey) + sand, silt, peat that have been glaciotectionized in a large scale. Erosive above this lies the red Moscow till which is capped by deglaciation sediments (fine-grained sand and small pond-sediments towards the top) belonging to the melting phase after the Moscow glaciation.

Photos (AL):

1406-1 – 1406-18

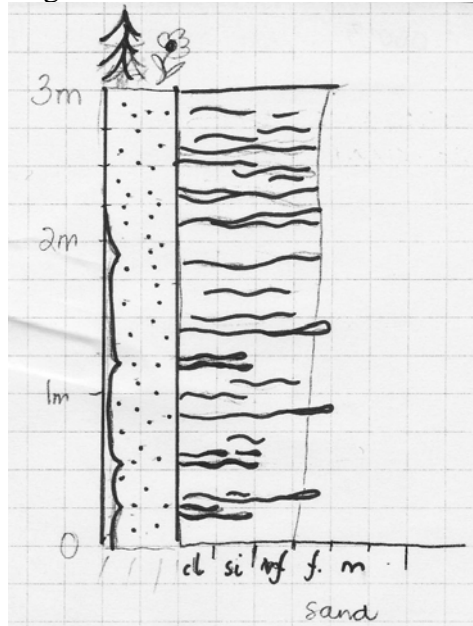
Photos (ELa)

140606/1-11

**Site 06013 (Road section close to pontoon bridge across river Nem)
(UTM 383923 6834640)**

Section by the road, orientated 240°-60°. It is possible to clean 3 m from the top of the section. The top of the section is at a nearly flat terrace-form, at least 100 m broad. Eiliv levels the top of the section and finds it to be +11 m compared to the river level at Vycheгда (which is here 110 m a.s.l.), suggesting the terrace to be at 121 m a.s.l.

Log site 06013:



Sediment description (cf. log):

The sediment consists of very fine sand with some (not much) silt. In general, the content and thickness of bright fine sand increase upwards (upwards coarsening). The sediment is stratified: undulating, discontinuous (crude) lamination, thickness of the lamina is from mm-scale up to several cm and some of the lamina shows only few cm of lateral distribution.

5 m towards 240° we dig a new 2,7 m high section. Also here do we find the same kind of sediments with the most fine-grained (and highest content of silt) sediments in the lower part. The crude lamination is here more continuous.

Samples:

Lum 06-216 – 218

Photos (AL):

1406-20 - 1406-25

Sunny and warm day with numerous mosquitoes!

Thursday 15.06 –Field work –Oz`jag
Maria, Astrid, Igor, Eiliv, Arthur, Jevgenij

Site 06008 (Oz`jag) (UTM 627439 6855865)

Section at the right bank of Vychedga, orientated 230°-50°, facing SSE, river level 95 m a.s.l.

Zero point (GPS) is at the 230°-end of the section. The section is about 250 m long and max. 12 m high.

Polaroid A-B-C-D site 06008:

Polaroid-mosaic covers the section from the 70 m point to the 250 m point.



Section 06008 – 70 m:

A bed of fine-grained sediments crops out in the lower part of the section (cf. Polaroid A, site 06008-70 m). We have to dig a lot to come into primary fine-grained sediments, but we are not able to find the transition/boundary to the overlying sand.

Description of the sediments (cf log 06008-70 m):

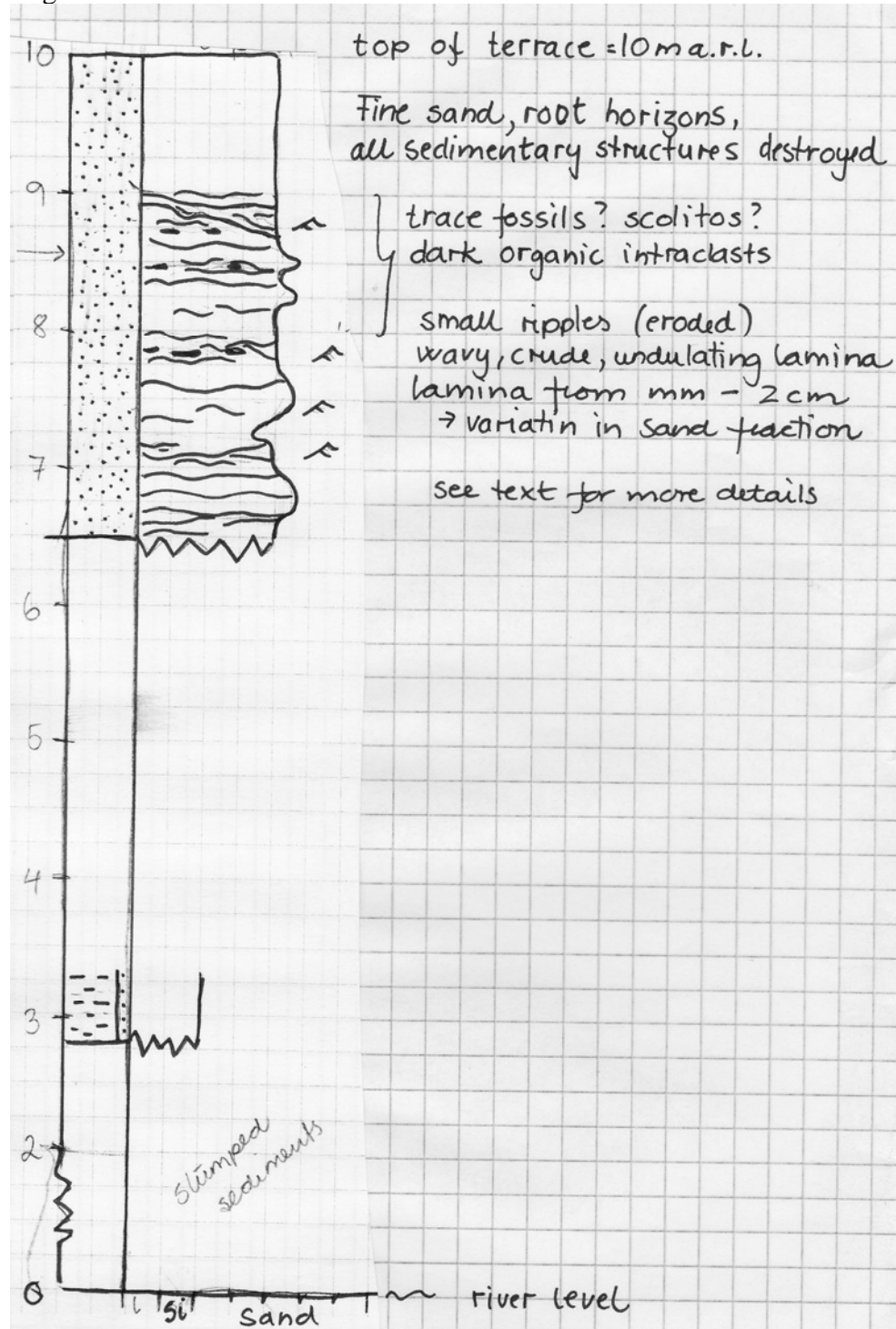
From the base level (2,85 m a.r.l.) up to 3,3 m we find primary fine-grained, in situ sediments: Sandy silt with dark/black spots, likely from young roots (as we can see thin roots coming out from the sediment wall). The silt is not homogeneous and contains some bright horizons and zones that may be from grain size-variations (little higher content of sand fraction). The overlying sand is slumped and we suggest that the boundary between the silt and the fine sand we can see in the section not is the primary transition/boundary. However, we conclude that the fine sand above this silt show primary sedimentary structures and similar facies as the sand described from the upper part of the section (see below and log). Likely we are close to the primary sediment boundary suggesting that sediment transition not is gradual (eg. from deep water facies to shallow water/shallow channels) but rather representing a more marked change in environment.

At the top of the river section, about 2 m further towards the SW, we log the upper part of the section:

Topmost part, level 9-10 m: fine sand with root horizons, primary structures are destroyed. The sand below (about 2,5 m thick) is dominated by fine to medium sand, laminated (crude, undulating, wavy), thin lamina mm up to 2 cm, small and eroded ripples, low-angle x-bedding, intraclasts (dark organic remnants), trace fossils? (scolitos?). The lower boundary is not observed.

We follow the sediments about 3 m towards the right to evaluate the lateral variation and the eventually connection with the deltaic slope sediments Maria describe and log at site 06008-120 m. We find that the fine sand unit from 07008-70 m is truncated by a unit of fine to medium sand in which show large(r) channels filled with planar laminated medium to coarse sand. We conclude that this may be correlative and a lateral variation to the sediments Maria describe from 06008-120m.

Log site 06008-70 m:



Section 06008 – 120 m:

Marias diary

Samples:

C14 06-401

Lum 06-219 – 224

Photos (AL):

1506-2 - 1506-49

Photos (ELa):

150606/1-13

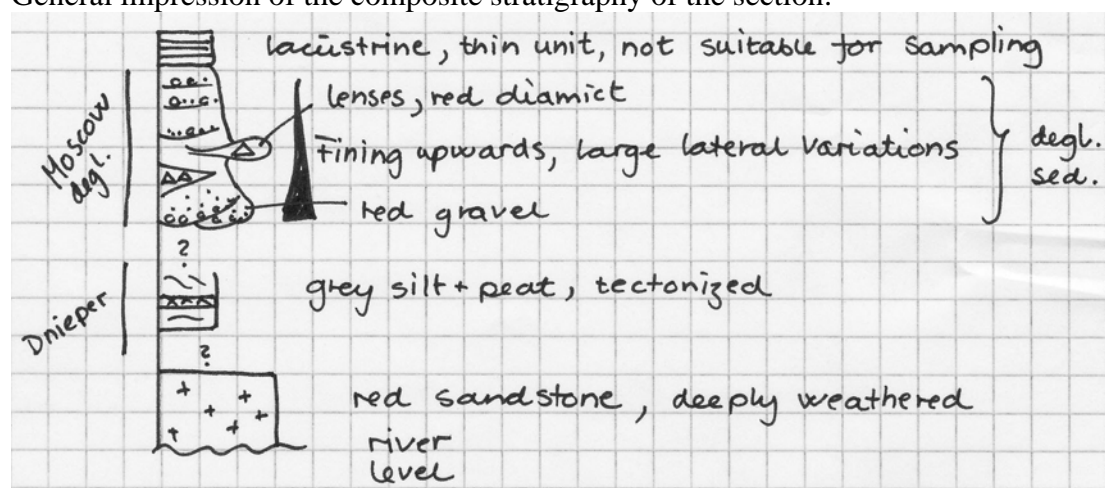
Friday 16.06 –Field work

Maria, Astrid, Igor, Eiliv, Arthur, Jevgenij

Site 06014 (Yl'janovo) (UTM 632139 6857422)

River section, at the right bank of Vychehda, orientation 230°-50°. The surface is a smooth, low relief terrace-form, most likely an erosive form. The section is up to 12 m high and about 1150 m long. Maria makes notes in the diary. Astrid takes photos. Eiliv levels. Point observations are made along the section.
0-point at eastern end of profile.

General impression of the composite stratigraphy of the section:



We suggest the stratigraphy to be old (Moscowian and Dnieper) and decide not to work in details. The locality would be interesting and good to work further on if focussing on old glacial stratigraphy.

Photos (AL):

1606-4 - 1606-31

Photo (ELa):

160606-1

Saturday 17.06 –Field work
Maria, Astrid, Igor, Eiliv, Arthur, Jevgenij

We leave the school in Ust Nem in the morning.

Photos (ELa):
170606/1-6

**Site 06015 (Gravel pit along the main road between Ust Kulom and Oz'jak)
(UTM 644248 6846742)**

Gravel pit close to the road. Several small 2-3 m high sections show stratified sandy gravel – gravely sand. The individual beds are stratified to more massive. The colour of the sediments is red, very similar to the red colour of the deglacial/ gravely sediments at site 06014.

The surface has a somewhat undulating character and seems to have more topographic variations than suggested from the distant. A channel pattern in where several small channels merge into one larger channel (6-7 m deep) appears at the surface. The upper surface around 140 m a.s.l., i.e. above highest terrace. Probably some sort of glaciofluvial fan/sandur system.

Photos (AL):
1706-9 - 1706-12

Photos (ELa):
170606/8-10

Site 06016 (Small section in deep ravine along the main road, across the road at YI'janovo monastery) (UTM 0635193 6857419)

Section in deep ravine by the road-side, section about 2 m high. A red diamict (Moscowian till) with long-transported clasts in fine-grained matrix appears.

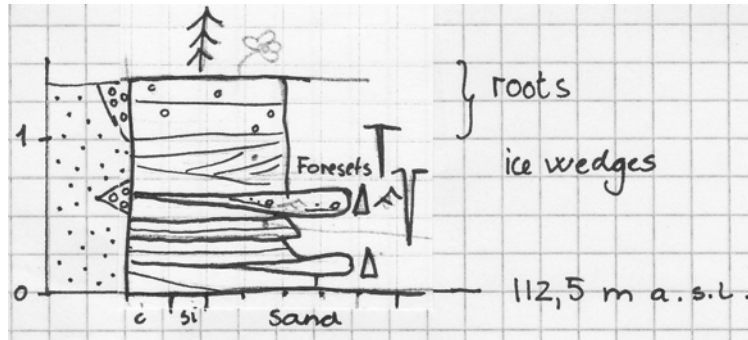
Photos (AL):
1706-13 - 1706-15

Photos (ELa):
170606.11 (Lunch)

Site 06017 (Terrace behind Oz'jak section) (UTM 629583 6859747)

Section by the road side, gravely sand and sand. We have a general discussion about how should we expect sediments related to the upper lake-levels to be (structures, thickness, morphology etc.) and how we can be sure that the sediments we choose to sample for dating really are the sediments we are looking for, for example if the beach sediments only are slightly reworked deposits and that the sediments within terrace forms are of older age than the erosive terrace itself.

Sketch of the section:



Description of the sediments (cf. sketch):

Stratified fine sand dominates and zones of massive sand with gravels appear. Graded beds (coarse sand to fine sand) show internal lamination and the individual bed is not laterally continuous. Low-angle x-beds and ripples exist. In the upper 55 cm, the sediments are chaotic and disturbed (not syndimentary): Faults, slumps and small “blocks” of massive, unsorted gravely sand appear in the stratified sand. Also in the upper part appear a reddish precipitation and dark spots may be organic detritus. Several (few) ice-wedge casts appear in the sediments and at least one of them ends in the sediment (ends below the uppermost Lum 06-225 sample, see sketch).

We suggest that the syndimentary formed ice-wedge casts and the deformation structures are related to each other proposing a depositional environment that at some time and at least periodically has been subaerially exposed.

Samples:

Lum 06-225
Lum 06-226

Photos (AL):

1706-19 - 1706-30

Photos (ELa):

170606/13-16

Site 06018 (Transverse terrace profile, Oz'jak)

We level a transverse terrace profile from 06018A (highest altitude) to 06018E (lowest altitude). This since we want to find the highest elevation a.s.l. and the positions in where the potential to search for beach erosion, beach sediments in stratigraphic position etc., should be best. The maximum altitude in this terrain is about 132 m a.s.l., suggesting that this is close to/exact the altitude of the highest proposed terrace-level in the area. As we do not find higher elevations in the area, we suggest it would be difficult to find sediments or morphological traces of high lake levels that could be sampled for dating.

Levelling the profile:

Site	Altitude a.s.l.	GPS position
06018A	132	0630986-6959797
06018B	125	0630252-6860123
06018C (= 06017)	114	0629576-6859702
06018D (sand terrace at the village)	114	0628130-6856144
06018E (= 06008)	95	0628151-6856043

Site 06019 (Small section along the main road just below hill with loc. 06018A) (UTM 630829 6859852)

2-3m high sections by the road side by site 06018A. The top of the section is at ca. 125 m a.s.l. We clean the top of the section. The sediment is fine to medium sand with lenses of unsorted gravel in a sandy matrix. Diffuse stratification that looks deformed appears. The sand is supposedly just below the highest shore-level, but we are not able to relate it to a shore. Thus could be anything from Saalian deglacial to fluvial/glacifluvial related to a younger lake phase.

Photos (AL):

1706-18

Photos (ELa):

170606-12

170606/20-30

Sunday 18.06 –Field work
Maria, Astrid, Igor, Eiliv, Arthur, Jevgenij

We stay in tents by village Ust Lochkim

Photos (ELa):
180606/1-3

Site 06020 (Nidz, River Lokchim) (UTM 543538 6851889)

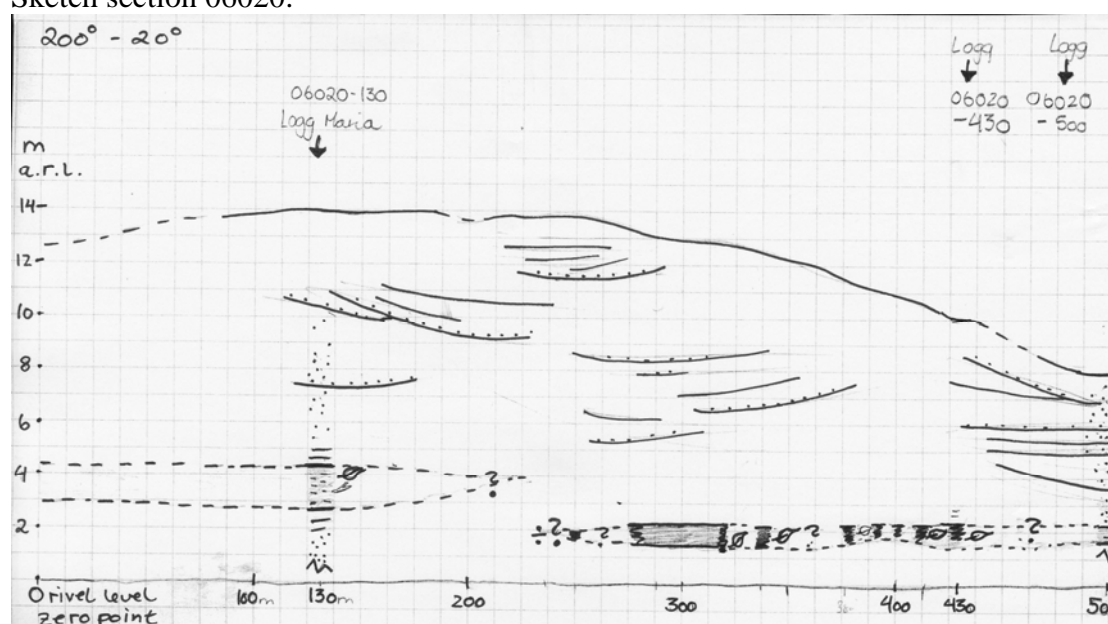
To arrive to this site we rent a small boat from Ust Lochkim. During the day we had two short periods with heavy rainfall, but managed well by escaping into the woods.

Large river section at the right river bank, more than 500 m long, 10-12 m high. Orientation 200°-20°, facing east. The river level is 82 m a.s.l. Zero point (GPS) is at 200°, i.e. downstream end of section. Eiliv takes photo-mosaic of the section from the boat and starts from the upstream position, 550 m (at 20°).

Eiliv and Astrid take a walk along the section to get an impression of the sediments/stratigraphy. A marked peat horizon(s) can be followed throughout large part of the section. From about 500 m from the zero point and further upstream, slumped sediments and vegetation in addition to many overturned trees make it difficult to work in that part of the section. We decide to log the section at 500 m, 430 m and 130 m (Marias diary), and to laterally map/follow the peat horizon(s).

A general sketch of the river section shows the main structures and distribution of the peat beds within the fluvial sandy sediments, and the location of the three logs from the section.

Sketch section 06020:



Comments on the interpretation:

The sediments within the section indicate a fluvial system in where small basins (at least two) appear at different stratigraphic levels in the lowermost part of the section; the tops of the basins are at different altitudes whereas the bases of the basins are more irregular. At the flanks, the clay content decreases whereas the silt content increases, and the appearances of macrofossils (leaves, twigs) become absent. The overlying sand show large scaled trough-forms. Maria measures main transport directions and describe these forms in more details. Polaroid-mosaic of these forms is in Marias diary.

Site 06020-500 m:

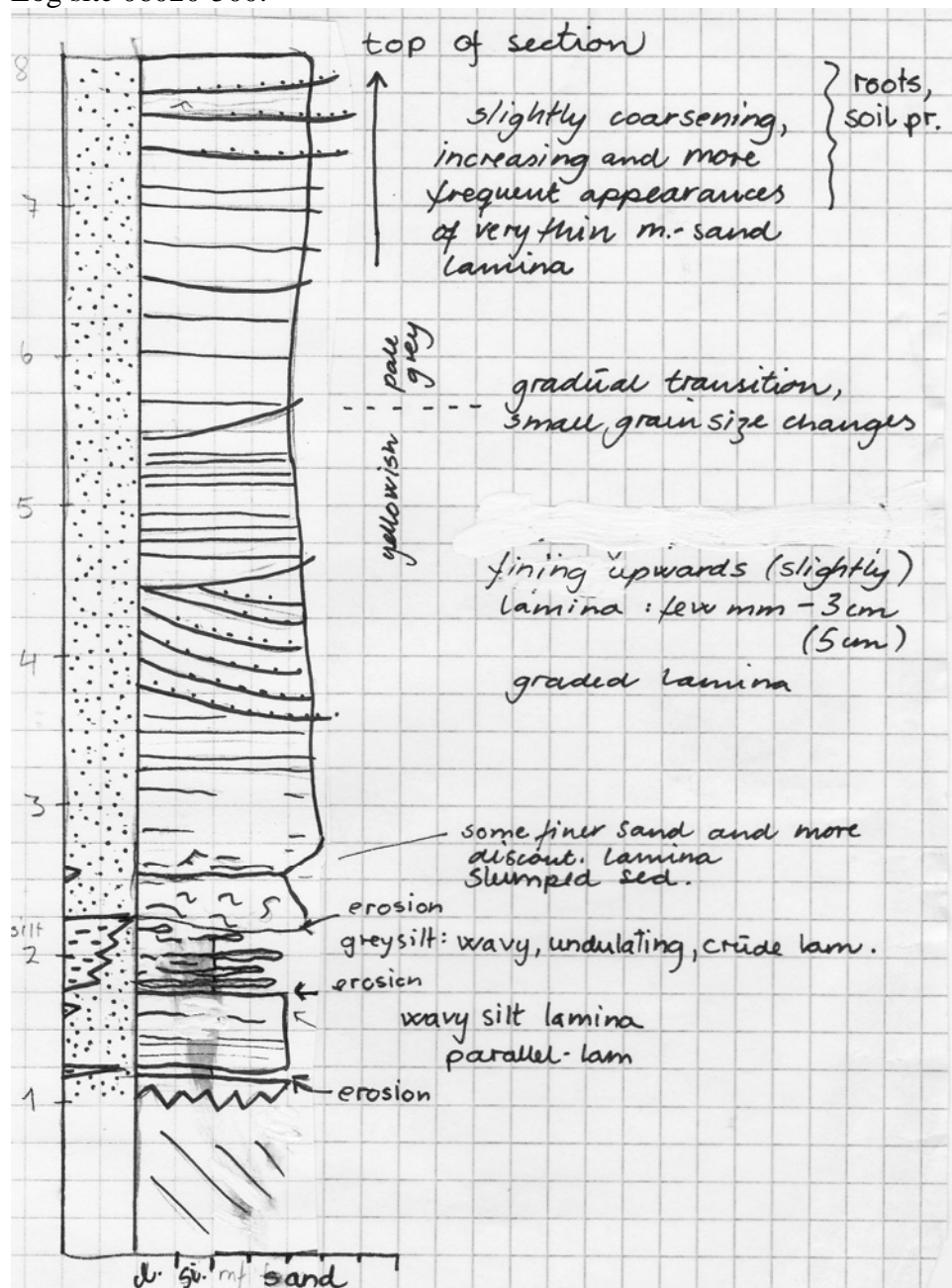
Comments (cf. log 06020-500 m):

-Grey silt (1,75-2,25 m a.r.l.): Erosion below the silt bed and within the bed.

Undulating, discontinuous sand-silt lamina, the lamina is most continuous (and thickest) in the lower part of the bed.

-(2,5m a.r.l. – top of the section): Sandy unit that change colour from yellowish to pale grey towards the top. The unit consists of large-scaled trough-cross bedded fine-medium sand. Individual beds and lamina show often upward fining.

Log site 06020-500:

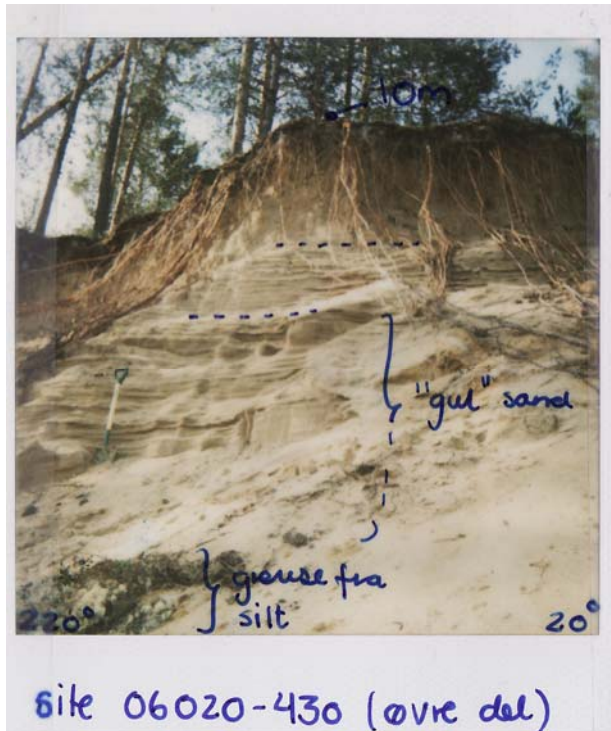


Site 06020-430 m:

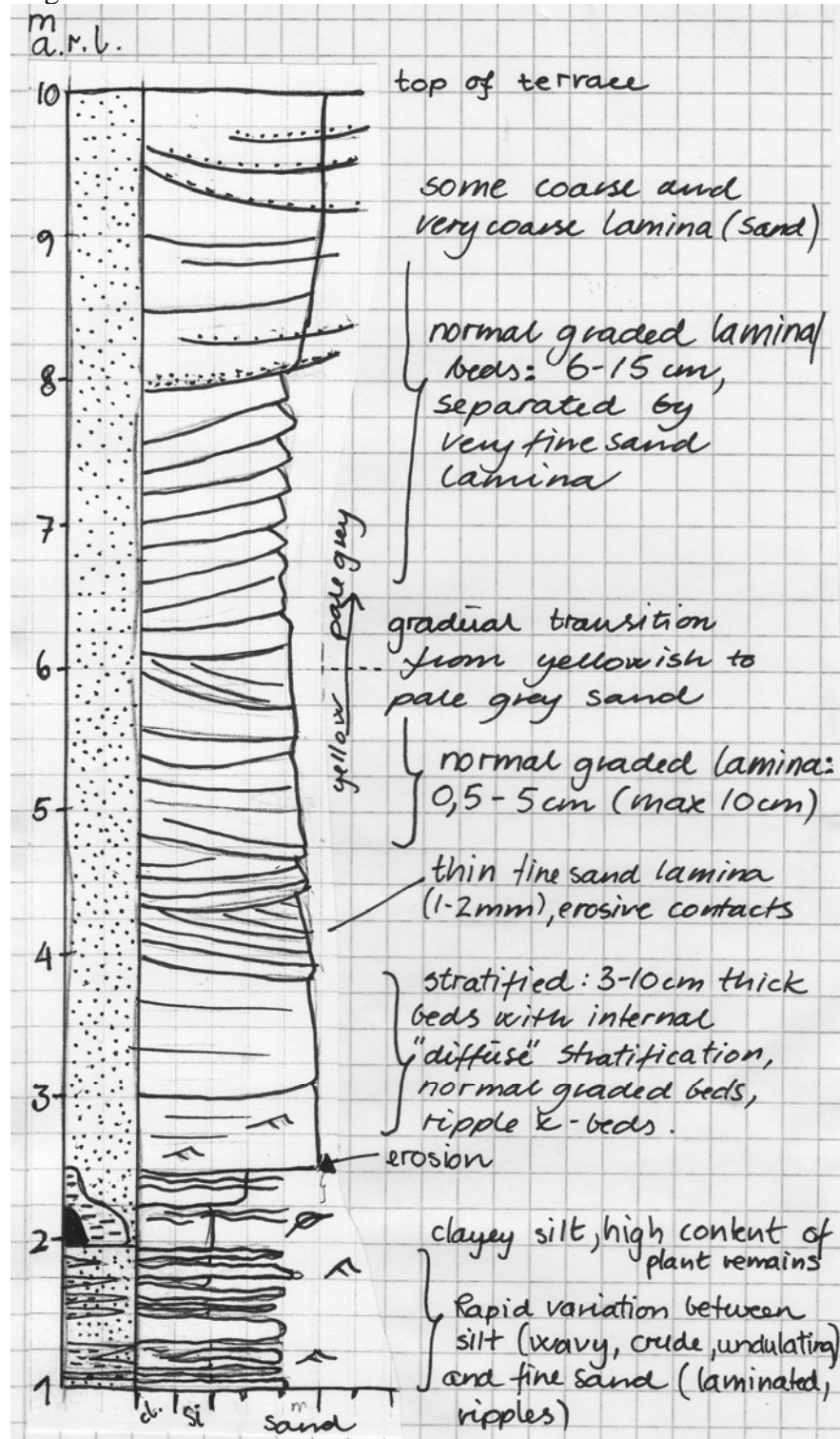
Comments (cf. log 06020-430 m):

The sediments described in this log show similar facies and upward changes as log site 06020-500 m. The sandy part of the succession (from ca. 2,5 m and upwards) shows well-defined normal graded beds.

Polaroid site 06020-430 m:



Log site 06020-430 m:



Samples:

06-227 – 230 (Site 06020-130)

06-231 – 232 (Site 06020-430)

Photos (AL):

1806-4 - 1806-51

Photos (ELa):

1806067/4-8

180606/9-50 (Mozaic)

180606/51-61

Monday 19.06 –Field work

Maria, Astrid, Igor, Eiliv, Arthur, Jevgenij

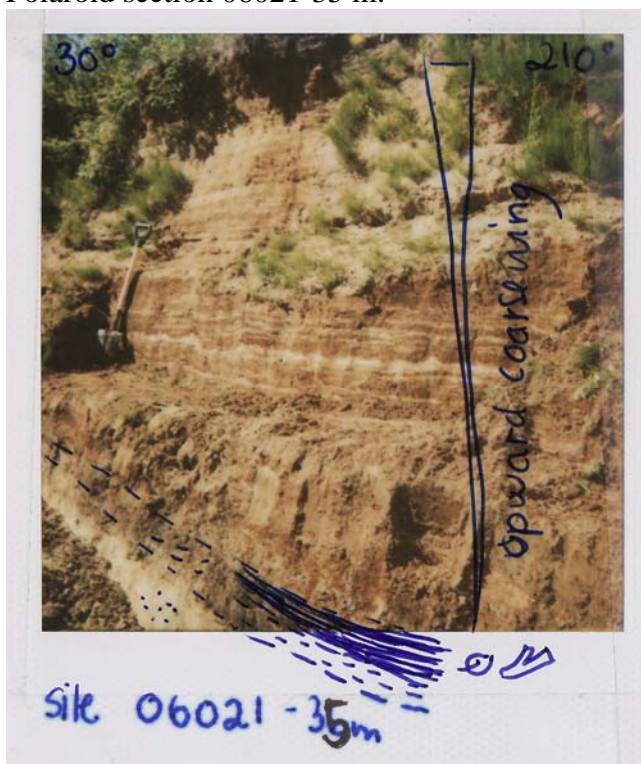
Site 06021 (Lokchim) (UTM 546005 6804500)

River section by the river Lockim, oriented 30°-210°. The section is at the right bank, downstream part of a large meander curve. Zero point is at 30°. The river level is 98 m a.s.l.

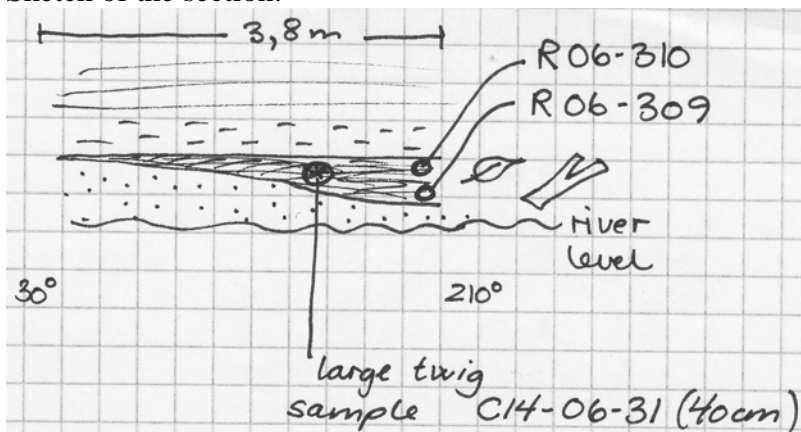
Site 06021-35 m

The sediments in the section indicate a fluvial-bog system.

Polaroid section 06021-35 m:



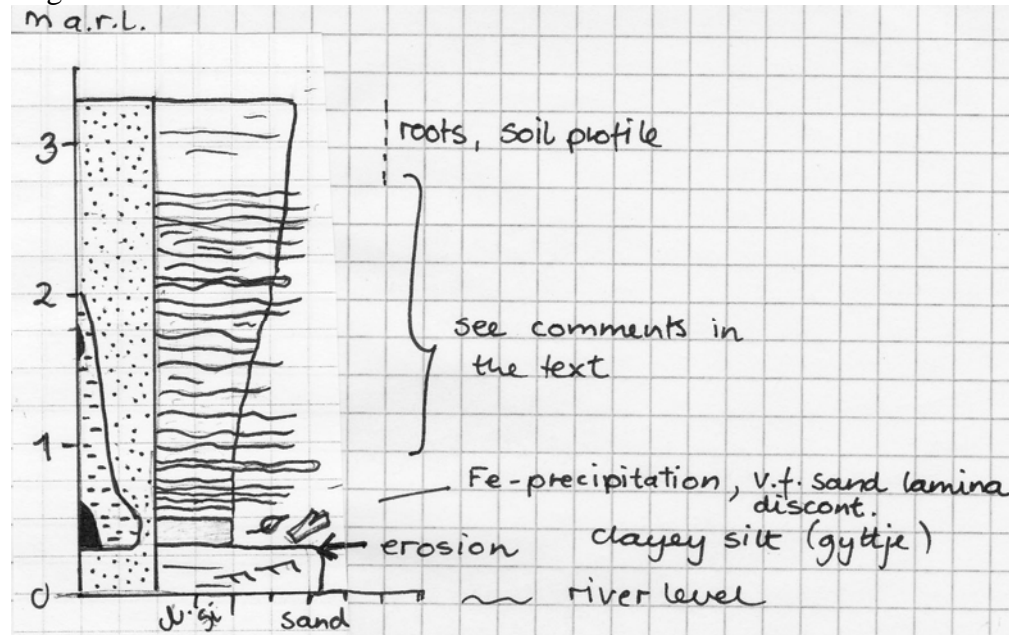
Sketch of the section:



Comments (cf. log site 06021-35m):

Above the clayey silty bed (gyttja) there is a general coarsening upwards from (sandy) silt to fine sand. The silt disappears upwards whereas the sand lamina become thicker and with higher frequencies upwards. The laminae vary in thickness (also undulating), and have longer lateral distribution upwards. Lenses of sand appear also.

Log site 06021-35 m:



Samples:

06-233 – 234

Photos (AL):

1906-5- 1909-15

06-227 – 230

Photos (ELa):

190606/1-4

190606/5-7 (Mozaic)

190606 – 8 (Overview)

190606 – 9 (Candy)

Tuesday 20.06 –Syktyvkar-Ljali

Maria, Astrid, Igor, Eiliv, Arthur, Jevgenij

In the morning we strike the tents and leave Ust Lochkim for the field station at Ljali. We have a break in Syktyvkar where we buy sample tubes, food and have lunch. We arrive Ljali where we put up our tents at 19:00.

Photos (ELa):

200606/10-13: Long day

Wednesday 21.06 –Field work (Kultovka)
Maria, Astrid, Igor, Eiliv, Arthur, Jevgenij

Site 06006 (Kultovka) (UTM 489596 6925212)

The zero point is at the gravel bar at the right shore of the river Kultovka, a little downstream from the section. To reach the localities and the zero point we have to cross the river using the rubber boat. River Kultovka is a tributary to Vychegda.

Site 06006-450 m

Section at the right bank of the river Kultovka. The section is 6-7 m high and slumped sediments and vegetation (trees) appear in the lower part. We dig about 2,5 m in the upper part of the section. The sediments show large lateral and vertical variations; dominated by medium sand, some coarse sand. Finer sand fraction and some gravel also appear. The sand is stratified, inclined and planar bedding appear. A few oversized pebble clasts found in some sand beds.

We discuss if this site is the "key"-locality described by Lavrov, but we are not sure about it.

Probably all fluvial.

Site 06006-70m

Section at the right bank of Kultovka, ca. 6-7 m high. The sediments are planar x-bedded and coarse sand dominates. In places the sand is gravelly, and "lag" of cobbly gravel appears in the sand.

Maria makes more detailed notes at this site.

Samples:

06-235 – 237

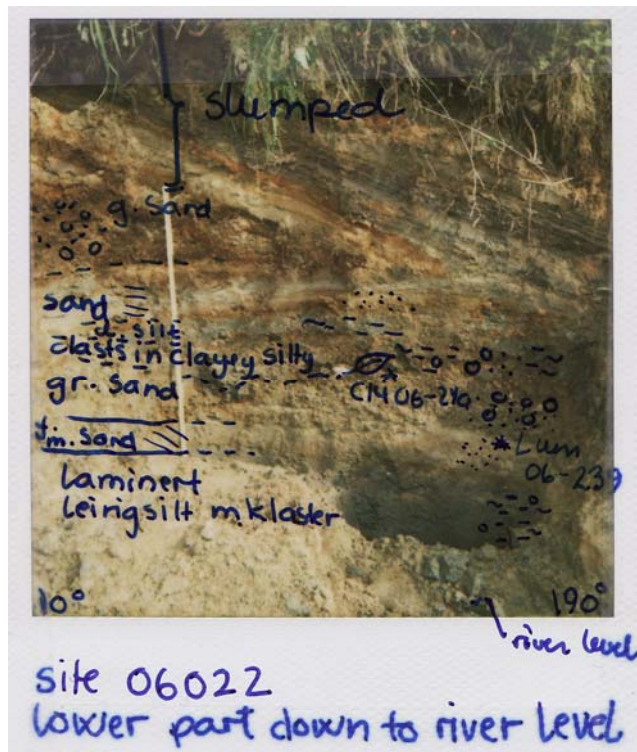
Site 06022 (Kultovka) (UTM 0489578-6925194)

River section located ca. 450 m downstream from site 06006 at the right bank of Kultovka. The section is about 12 m high (top above river) and may be the "key"-locality in which is described by Lavrov. The section is oriented 10°-190°. The section is covered by vegetation (trees, ground vegetation) and we have to dig at several places to get an impression of the sediments.

Description of the sediments (cf. polaroid and log in Marias diary):

The lower part of the section (down to the river level) is described from the polaroid photo: large vertical and lateral variation in grain-sizes. Further upwards (cf. photo 2206-5), level 1,75-3 m a.r.l. sand beds (laminated fine sand, medium and coarse sand) are up to 20 cm thick and appear inter-bedded with 3-5 cm thick silt lamina. In general the sand beds become thicker and the elements of silt laminae decrease upwards. Above this appears a fluvial sandy succession similar (in grain sizes) to the successions described from sites 06006-70 m and 06006-450 m. More detailed descriptions are in Marias diary.

Polaroid Site 06022:



Samples:

Lum 06-238 – 239
C14 06-240

Photos (AL):

2206-1 - 2206-9

Photos (ELa):

210606/1-4

Thursday 22.06 –Field work (Gam 1)
Maria, Astrid, Igor, Eiliv, Arthur, Jevgenij

Site 06004 (Gam 1) (UTM430047 6887216)

The Gam-terrace has been described by Lavrov.
Heavy rainfall and thunder caused a long lunch-break this day.
The section is orientated 260°-80°.
0-point at western end.

Site 06004-130 m

Detailed description (cf. log site 06004-130 m, part 1 + 2) (NB! The log starts at 5,75 m above the rivel level)

-0-ca. 1,5 m: Horizontal laminated fine sand, very fine sand, medium sand, silty sand and silt. Erosion appears below some of the laminae. Some of the laminae are normal graded, and thin (mm) laminae appear within some of the thin beds. Gravel clasts appear scattered.

-1,5-2 m: The silt content disappears upwards. The sand beds show more diffuse lamina, and the lamina becomes discontinuous. Some few gravel clasts are scattered.

-2-2,75 m: Fine and medium sand inter-bedded with thin silty very fine sand beds. Lamina and weakly developed ripple-cross bedding appear within the beds. Erosion appears below several of the lamina. Some gravel clasts appear scattered.

-2,75-3,5 m: Laminated fine-medium-coarse sand. Erosion appears below the lamina.

-3,5 m: Unsorted gravely lens of medium-coarse sand. Up to very coarse gravel fraction.

-3,5-4,25 m: Laminated medium sand, very fine sand is the finest fraction. Erosion below the lamina appears, and the lamina show irregular thickness.

-4,25-4,5 m: Graded lamina, medium to very fine sand. Some silt occurs. General fining upwards.

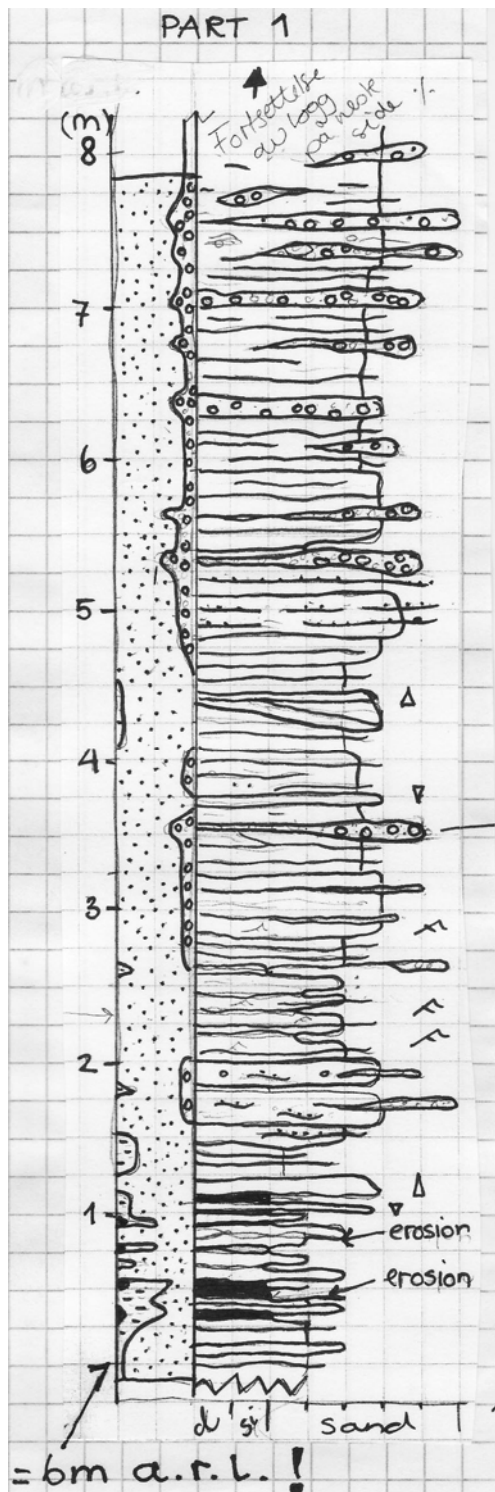
-4,5-5,25 m: Medium sand, diffuse zones/lamina of coarser sand fraction, scattered very fine gravel clasts.

-5,25-7 m: Medium, in places coarse sand, laminated, the lamina is discontinuous and show uneven thickness and has in places a chaotic character, erosion appear often below individual lamina. Lenses of coarse-very coarse sand occur in-between the medium sand, and these lenses show erosion below, are unsorted and contain gravel clasts.

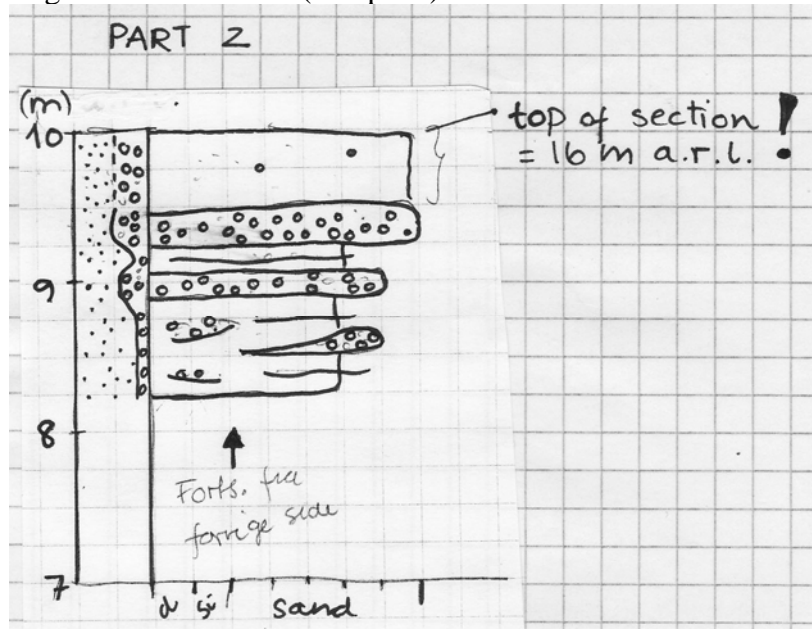
-7-8,9 m: medium to coarse and with increasing frequencies of gravely sand lenses/zones (compared to the underlying sediment). Up to very coarse gravel fraction appears within the sand. 1 cobble is found. Some of the gravely zones in the upper part appear to be chaotic and may have been dumped into the sand.

-8,9-10 m: Sandy gravel/gravely sand, the individual beds are not stratified. The uppermost 0,5 meter is a dry soil profile and no structures are registered.

Log site 06004-130 m (two parts):



Log site 06004-130 m (two parts):



Samples:

06-241 – 242

Site 06004-300 m

Log from this part of the section is in Marias diary. The log is from 7 m above the river level up to 16 m. In the lower part appear a reddish diamict (Moscowian till?). Above this appear deglaciation sediments.

Samples:

06-243 – 244

Photos (AL):

2206-2 - 2206-57

Photos (ELa):

220606/2-6

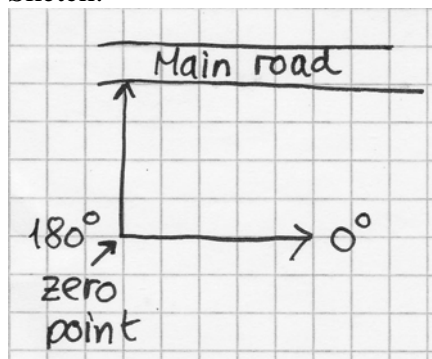
Friday 23.06 –Field work – Drive to Syktyvkar
Maria, Astrid, Igor, Eiliv, Arthur, Jevgenij

Broke camp at Ljali (Komi) field station

Site 06007 (Kultovka) (UTM 488928 6925974)

Sand quarry close to the road. Zero point is at the corner of the quarry(see sketch). Sections are about 6-7 m high, and slumped sediments appear in the lower part of these.

Sketch:



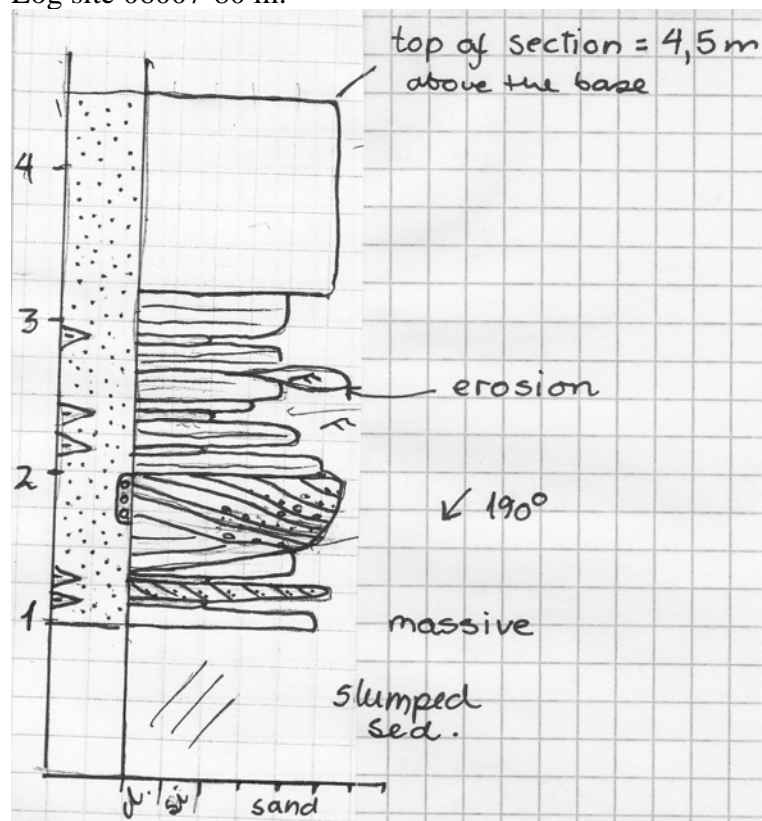
We make a description and log one section where we have the most continuous succession of the sediments (at 80 m from the zero point towards the North). Maria and Igor dig several small sections and the sediments show similar facies as described from site 06007-80 m.

Site 06007-80 m:

Detailed description of some of the sediments (cf. log 06007-90 m):

- Ca. 1,25 m: Normal graded planar foresets (coarse to medium sand).
- 1,25-1,5 m: Horizontal laminated, lamina of silt (variable thickness), graded lamina.
- 1,5-2 m: Upwards coarsening, sigmoidal foreset pattern. Gravel clasts and intraclasts of silt appear in the sand, at the base of each lamina. Current direction is towards 190°.
- 2-3,25 m: Sand beds of variable thickness, grains sizes vary from silty sand and up to medium to coarse sand. Individual beds are horizontal laminated, graded lamina and ripples appear, some lamina is thin fine sand within thicker medium sand, erosion below some of the lamina, lenses of sand appear.
- 3,25-4,5 m: We discuss if this sand could be eolian, but agree that this not is likely. We find low-angle planar-cross bedded medium to coarse sand, normal graded lamina/beds and eroded ripple cross-bedded sand. We do not find inversed graded foresets. The uppermost 0,5 m is more massive, likely due to the soil profile and many roots that can have destroyed the primary structures.

Log site 06007-80 m:



Samples:

Lum 06-245 – 248
Ref 06-249

Photos (AL):

2306-5 - 2306-27

Photos (ELa):

230606/1-8

Site 06023 (Charsovo) (UTM 479565 6874739)

Large river section at the right bank of Vychehda, next to big bridge. Zero point is at the top of the section (= 13 m above the river level). The section is oriented 270°-90°, facing south.

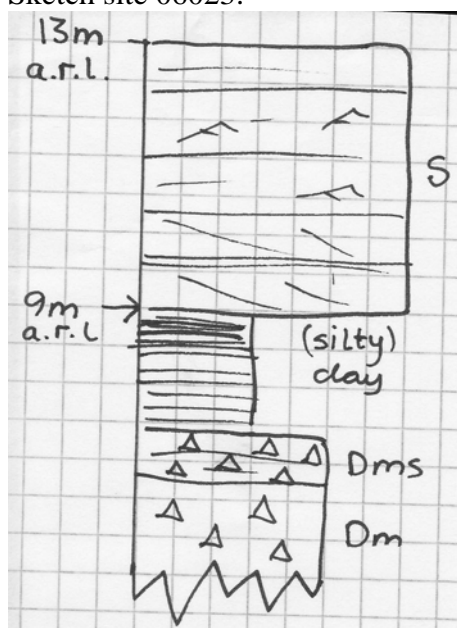
Detailed log is in Marias diary.

General impression of the stratigraphy of the section (see sketch):

-The lowermost diamict has a sandy silty matrix, and numerous clasts appear in the matrix. Several of these are striated. The diamict is massive, but the uppermost ca. 70 cm of the diamict becomes stratified.

-Lacustrine very fine laminated silty clay. The silt content is very low. The clay lamina consist of 100 % clay and is only mm thick. The lamina is thinnest in the upper part in where also the silt content is absent. The lamina is granulated and fractionated.

Sketch site 06023:



Samples:

Lum 06-250 -252

Ref 06-253

C14 06-254

Photos (AL):

2306-30 - 2306-40

Photos (ELa):

230606/9-24

When finished we drove to Syktyvkar where we find a hotel for the night (Hotel Sentralnyi).

Saturday 24.06 –Syktyvkar-Kotlas
Maria, Astrid, Igor, Eiliv, Arthur, Jevgenij

We leave Syktyvkar at 10:30 and arrive Kotlas about 17:00. Eiliv, Igor, Maria and Arthur find accommodation in hotel Sovjetskaya. The driver stays at his home place. We have dinner and Astrid leave for St. Petersburg by train at 21:50. Astrid arrives St. Petersburg on *Sunday 25.06* (21:35) and leaves for Trondheim on *Monday 26.06*.

Photos (ELa):
240606/1-10

Sunday 25.06 –Kotlas – Artjukovskaya (South of Krasnoborsk)
Maria, Igor, Eiliv, Arthur, Jevgenij
Cf. also field notes Maria Jensen.

Bought lum tubes train tickets and made other practical arrangements in Kotlas in the morning. After lunch we left Kotlas and went northwards along Dvina towards Krasnoborsk.

Site 06024 (Ust Kanza) (UTM 562544 6817640)

Section c. 20 km upstream of Krasnoborsk on the left bank of Dvina (Ust Kanza). Promising section; lacustrine with possible aeolian on top. We worked at this section on June 27 and 28.

Site 06029 (Lapunov, close to pioneer camp) (UTM 541485 6829628)

Section c. 6 km downstream from Krasnoborsk on Dvina's left bank. High cliff with much vegetation, and a couple of small sections. Saw beach sand capped by reddish diamicton, banded likely mudflows. Strange contact with beach sand, "stepwise", probably not sedimentary, could be slumped. Diamict interfingers upwards with laminated sandy silt, lacustrine. Interesting sequence, but probably all Saalian or older.

Put tents up at Artjukovskaya south of Krasnoborsk at around 9 p.m.

Photo (ELa):
250606-1

Monday 26.06 – Artjukovskaya – Artjukovskaya
Maria, Igor, Eiliv, Arthur, Jevgenij
Cf. also field notes Maria Jensen.

Rain in the morning. Spent until noon in camp.
Made agreement for renting boat to go to Tolokonka, and visited fishing camp on Dvina.

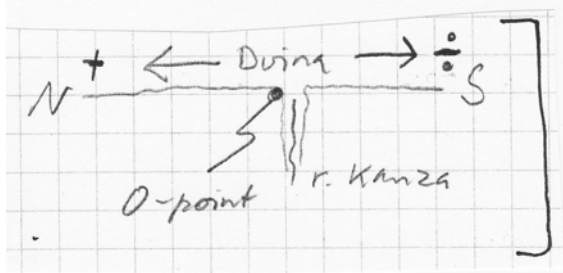
Photos (ELa):
260606/1-14

Tuesday 27.06 – Artjukovskaya – Ust Kanza – Artjukovskaya
Maria, Igor, Eiliv, Arthur, Jevgenij
Cf. also field notes Maria Jensen.

Site 06024 Ust Kanza (UTM 562544 6817640)

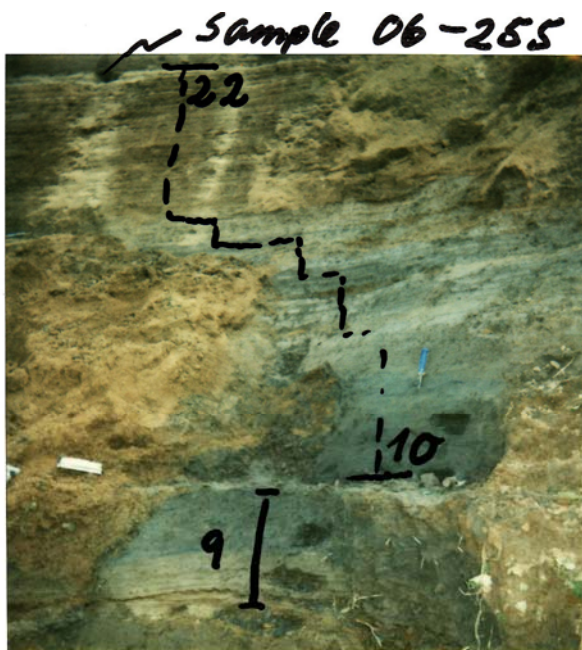
Left bank of river Dvina, section oriented 350 – 170⁰, facing east.
0-point on top of section at south end on cornertowards ravine with river Kanza.

Sketch:



Worked at site 06024-10.

Polaroid, site 06024-10m (cf. Photo mosaic EL):



Loc 06024-10
27.06.06
Photo mosaic 9-22

Photos (ELa):

270606/1-8

270606/9-22 (Mozaic)

270606/23-28

Polaroid of showing how photo mosaic was taken.

Samples:

LUM 06-257 – 258

C14 06-259 – 260

Wednesday 28.06 – Artjukovskaya – Ust Kanza – Artjukovskaya
Maria, Igor, Eiliv, Arthur, Jevgenij
Cf. also field notes Maria Jensen.

Site 06024 Ust Kanza (UTM 562544 6817640)

Continued working on the site from yesterday. No wind, sunny, warm.

Main stratigraphic units at 06024-10:

Sand

Laminated – glaciolac

Thick laminated, partly with ripples, coarsening upwards – tidal

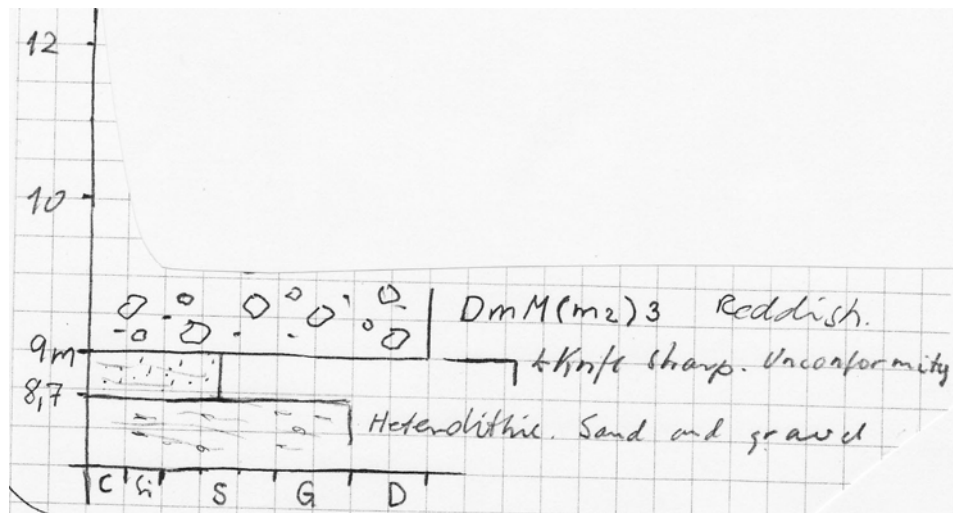
Moscow till (thin sand at upper boundary)

Photo (ELa):

280606/1-2

Site 06024 - -120m (southwards from 0-point, S of river Kanza):

Log of lower part of 06024- -120 (to be spaced into Marias log of the site):



The sand and gravel below the Moscow till has some banding. Not primary structures, interpreted as glaciotectonic banding.

Photo (ELa):

280606/3-14

Samples:

LUM 06-261 – 262

*Thursday 29.06 – Artjukovskaya – Tolokonka – Artjukovskaya
Maria, Igor, Eiliv, Arthur, Jevgenij
Cf. also field notes Maria Jensen.*

Site 06025 Tolokonka (UTM 525972 6846573)

Ca. 4 km long section on the right bank of river Dvina. 0-point at the south end of section, facing west. The sequence is about 28 m thick starting at river level. Logged the section 3.19 km from 0-point (field notes Maria). Igor counted varves in upper laminated (341 couplets).

Photos (ELA):

- 290606/1-2: Section from a distance
- 290606/3-121: Photo mosaic starting in the south.
- 290606-122: Lunch
- 290606/123-135: Section at 3.19 km
- 290606/136-137: In camp at Artjukovskaya

Samples:

- LUM 06-263 – 265
- C14 06-266

Returned to Tolokonka on July 1.

Friday 30.06 – Artjukovskaya – river Ljabla – Artjukovskaya
Maria, Igor, Eiliv, Arthur, Jevgenij
Cf. also field notes Maria Jensen.

Rain and wind from the morning. Rain stops at lunchtime, and we can go out in the field.

Made two trips on side roads to the main road along Dvina.

1. From the main road towards SW towards the village Molodilovskaya. Towards the village we passed two terrace levels; the lower being at the level of the main road + one higher further inland.

2. The second road starts in Krasnoborsk and runs towards the SW. ca. 2 km from the highway at ca. 70-75 m a.s.l. there is a small section along the road. Fine sandy sediments. Lacks context to make use of it.

Site 06026 – river Ljabla (UTM 540082 6817077)

Section located on small tributary river, oriented 30-210°, facing west.

Logs from two areas (A and B) spaced together (field notes Maria).

Photos (ELa):

300606/1-13

Samples:

LUM 06-267 – 268

REF 06-269 – 270

LUM 06-271 – 273

C14 06-274

*Saturday 01.07 – Artjukovskaya – Tolokonka – Artjukovskaya
Maria, Igor, Eiliv, Arthur, Jevgenij
Cf. also field notes Maria Jensen.*

Continued work at Tolokonka, see notes 29.06.2006.

Site 06025-3.19 km (cont.)

Continued sampling and logging (Marias field notes) where we left two days earlier-

Photos (ELa):

010706/1-28

Samples:

C14 06-275 – 276

LUM 06-277 – 281

C14 06-282

LUM 06-283 – 285

*Sunday 02.07 – Artjukovskaya – Permagore – Lapunovo – Artjukovskaya
Maria, Igor, Eiliv, Arthur, Jevgenij
Cf. also field notes Maria Jensen.*

Measured/checked terraces along highway to Krasnoborsk.

First stop was in the southern outskirts of Krasnoborsk, did not give it a site number, took pictures and measured altitudes. This is close to the Yerda river. Altitudes were calibrated relative to the Ljabla river at 32 m a.s.l. (after crossing the river to the south). Terrace top ca. 28 m above Ljabla, i.e. ca. 60 m a.s.l.

This probably equivalent to Gam terrace according to Lavrov (as he seemingly defined all terraces below 110 m a.s.l. to Gam?).

Photos (ELa):

020706/1-9: Terrace at first stop

020706-10: House near Krasnoborsk

Site 06027A Terrace level outside Permagore (UTM 532624 6831997)

Turned left at the intersection to Permagore. We enter some terrace levels, the upper being ca. 80 m above the Ljabla river level (32 m a.s.l.), i.e. the terrace is ca. 112-113 m a.s.l.

A gravel pit into the terrace shows coarse sandy deltaic foresets with c. 0.5 m sandy to gravely topsets. Supposedly it built to a lake level, meaning that the terrace at Permagore belongs to this lake event. According to our previous reconstructions this is outside the Weichselian ice limit, i.e. the delta and terrace at this site is probably Saalian. (Note inserted 21.04.2007: Is the previous necessary so? Could it not be deltaic sediments in a Weichselian proglacial, ice dammed lake?).

Unfortunately, the sediments are considered to coarse grained for OSL, and accordingly not sampled.

Photos (ELa):

020706-11: Towards the terrace near Permogore.

020706/12-14: The delta at 06027A

Site 06027B (Section between terraces outside Permagore, 100 m a.s.l.) (UTM 532729 6832271)

Section in ditch by the road between terraces near Permagore, ca. 100 m a.s.l.

Made a couple of small excavations in the ditch.

Reddish diamicton (Moscowian till) at the base. Gradual transition to a sediment above with less sand and clasts. This may be a glaciolacustrine sediment, but could be local without any large-scale implications. Furthermore, the gradual transition from the till below, suggests it is Saalian deglacial.

Photos (ELa):

020706-15-16

Site 06028 Permogore

Section on the left bank of river Dvina at the end of the road through the village Permogore.

Descriptions to Polaroid photos in Marias field notes. Contact between beach (below at loc A) and tidal (above at loc B) was observed at the corner between the two sections, i.e. there is a transition from beach – to sandy tidal – to fine grained tidal (see comment on site 06029 below). Work performed at site is very preliminary, much more should be done, a.o. cleaning up the beach – tidal contact.

Photos (ELa):

020706/17-18: Lunch at Permogore

020706/19-26: Section at Permogore

020706/27-28: Church at Permogore

Samples:

LUM 06- 286 – 287

Site 06029 Lapunovo (UTM 541485 6829628)

Left bank of river Dvina, near pioneer camp in village Lapunovo. Site first visited 25.06.2006.

Description to polaroids in Marias field notes.

Beach sand (as at 06028) is resting on weathered bedrock. Above beach and channel dunes there is an unconformity. Above the unconformity there is a stratified diamicton (Moscowian?). This may be mudflows. The mudflows interfingers with/transits into tidal rhythmites. Thus at this site the tidal sediments are clearly separated from the beach sediments. Accordingly it can be quite some age difference between the beach and the tidal sediments at the site, and also at 06028?

In the upper part of the cliff a little further downstream (site B in Marias notes) there is a brownish gravel with brownish diamicton (Moscowian) and laminated clay on top.

Photos (ELa):

020706/29-32

020706-33: In camp at Artjukovskaya

Monday 03.07 – Artjukovskaya – Kotlas
Maria, Igor, Eiliv, Arthur, Jevgenij

Broke camp and left for Kotlas. Packing of luggage etc. Stayed in hotel Sovjetskaya.

Photos (ELa):
030706/1-2

Tuesday 04.07 – Kotlas – Veliki Ustyug – Kotlas
Maria, Igor, Eiliv, Arthur, Jevgenij

Sent samples to Petrozavodsk, and visited the town Veliki Ustyug.
Last night in Kotlas

Photos (ELa):
040706/2-22

Wednesday 05.07 – Kotlas – train departure
Maria, Igor, Eiliv, Arthur, Jevgenij

Said goodbye to Jevgenij in Kotlas. The rest took the train to St. Petersburg.

Photo (Ela):
050706-3

Thursday 06.07 – Arrival by train in St. Petersburg
Maria, Igor, Eiliv, Arthur

Stayed in hotel Moscow.

Friday 06.07 St. Petersburg – Trondheim; St. Petersburg – Petrozavodsk

Maria and Eiliv left for Trondheim, Igor and Arthur for Petrozavodsk.