



# Quick scan of the freshwater part of the river Seine estuary

Peter Paalvast, Bram bij de Vaate & Alexander Klink

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## Summary

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A quick scan was made prior to a macrozoobenthos monitoring in the freshwater tidal section of the river Seine in order to obtain an impression of the area. This impression was needed to design a sampling protocol and to get insight into the physical structure of the main biotopes including the dominant species of its communities. The group of the Oligochaeta was present in most of the samples in relatively high numbers. With some exceptions all other taxa found were present accidentally or in relatively small numbers. However, the results do not reflect the actual composition of the macrozoobenthos communities because sampling during the quick scan only produced some rough snapshots.

# 1. Introduction

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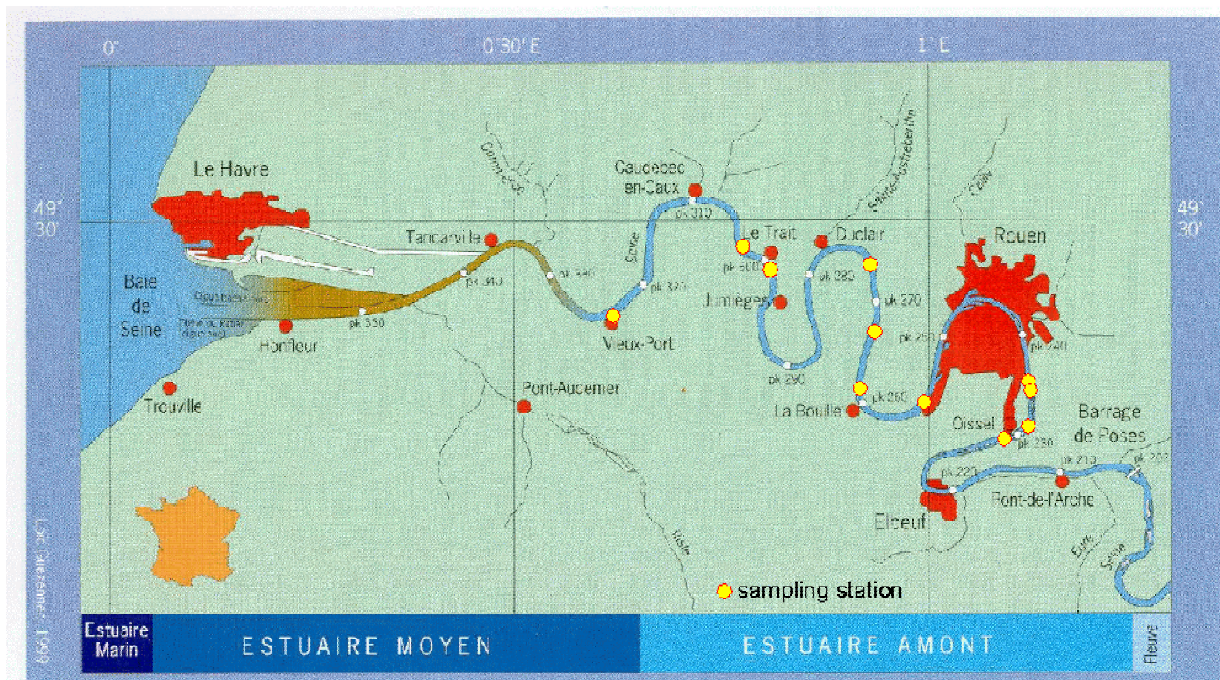
On October 3, 2005, Ecoconsult was asked to present a tender for monitoring and assessment activities in the field of Seine Aval's "Action II-2005-03", entitled: "Etat des peuplement benthiques dans la partie amont de l'estuaire". The tender was accepted in March 2006 and the convention signed on May 18 2006. The first activity planned in the project, being a quick scan of the fresh water tidal part of the river Seine, was performed already in the period December 6-8, 2005. This activity was considered to be important to get an impression of the main freshwater estuarine biotopes present, including their dominant macrofauna in it, previous to the design of a sampling program. The results of the quick scan are summarized in this report.



## 2. Sampling methods

The locations visited during the quick scan are given in the figure below. All locations upstream of Rouen were visited by boat on December 7, 2005., as well as the locations downstream of Rouen till pk 275. On December 8, 2006 all other locations were visited by car, which implied that at that river section only intertidal and shallow littoral zones could be sampled.

Map of the fresh water tidal part of the river Seine with indicated the locations visited (after Guézennec et al, 1999. Seine-Aval: un estuaire et ses problèmes. Programme scientifique Seine-Aval. Editions IFREMER. ISBN 2-84433-028-2).



During the survey next sampling devices were used:

1. Hand net, net opening 40x20 cm, 0,5 mm mesh.
2. Van Veen grab. With this device a bottom surface was sampled of about 450 cm<sup>2</sup>.
3. Triangular dredge:



Stones in the littoral zone were picked up by hand and immediately put into a bucket to brush them off. The material from these stones was collected on a 0,5 mm mesh sieve.  
All samples were preserved with ethanol 90%.

### 3. Results

The results presented in this interim report are the results of a quick scan made with the intention to get an impression of the freshwater tidal section of the River Seine. They do not reflect the macrozoobenthos community in that part of the river, but only give an idea of dominant species in main biotopes. In addition a valuable picture was obtained of the physical structure of these biotopes.

An overview of the quick scan results is summarized in the next table. Detailed information of each sampling location is given in next pages.

Overview of the quick scan results

	Sampling location								
	1	2	3	4	5	6	7	8	9
PK	235.5	234.7	231.8	231.5	229.2	229.2	256.5	261.5	267.5
Substrate	solid	mud	solid	mud	sand	steel	stones	solid	divers
<b>Vermes</b>									
Oligochaeta	126		55	347			90	324	
Hirudinea	18		2				30		
<b>Mollusca</b>									
Ancylidae			1						
Corbicula	51		1		4			40	
Dreissena			1						
Lymnaeidae							20		
Pisidae	6						4		
Viviparidae	1								
<b>Crustacea</b>									
Gammaridae	12		15				1		
<b>Diptera</b>									
Chironomidae							3		

	Sampling location								
	10	11	12	12	12	12	13	14	14
PK	274.1			325.7			303.7	299.6	
Substrate	mud	mud	stones	mud	mud	divers	stones	stones	mud
<b>Vermes</b>									
Oligochaeta	9775	12	43	504	15750	430		36	4
<b>Mollusca</b>									
Dreissena							13		
Lymnaeidae							1		
<b>Crustacea</b>									
Gammaridae			1						
Palaemonidae						3			
<b>Diptera</b>									
Chironomidae		3	4						
<b>Vertebrata</b>									
Pisces juv.						2			

Another result of the quick scan was the impression to be used for the design of a sampling strategy for the monitoring activities in next phase of the project.

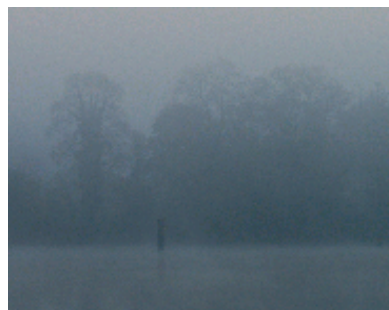


**Sampling station:** 001 **PK:** 235.5

**Date:** December 7, 2005 **time:** 09:15 hour

**Location coordinates UTM/UPS WGS 84:** **x-coordinate:** 363.686  
**y-coordinate:** 5471.545

**Map view and picture:**



**General description of the sampling location:**

Sampling was done at a location in the main channel located between Île de la Crapaudière and Île Ligard.

**Habitat:** shallow river bed

**Depth:** 4.8 m

**Bottom type/sediment:** solid rock

**Sampling method:** Van Veen grab

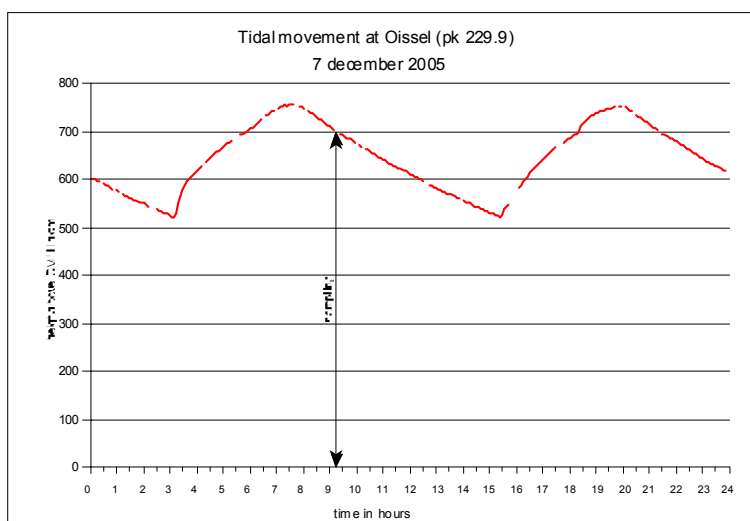
**Water temperature:** 7.4 °C

**Salinity in psu:** 0.1

**O<sub>2</sub>:** 6.9 mg/l (57%)

**pH:** 8.0

**Tidal phase during sampling:**



**Results:**

Number of animals found in the sample:

<b>Vermes</b>	
Oligochaeta	126
Hirudinea	18
<b>Mollusca</b>	
Corbicula	51
Pisidae	6
Viviparidae	1
<b>Crustacea</b>	
Gammaridae	12

**Sampling station:** 002 **PK:** 234.7

**Date:** December 7, 2005, **time:** 10:05 hour

**Location coordinates UTM/UPS WGS 84** **x-coordinate:** 363.685  
**y-coordinate:** 5470.802

**Map view and picture:**



**General description of sampling station:**  
10 meters downstream Île Bas des Vases

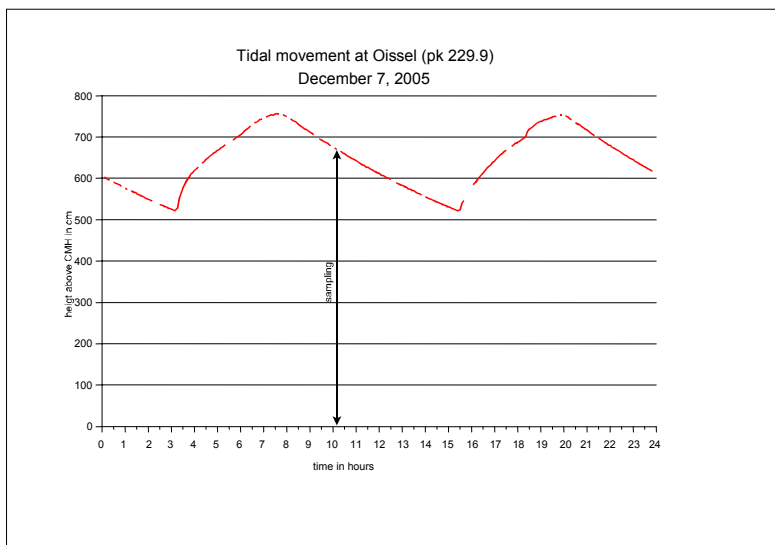
**Habitat:** shallow muddy river bed

**Depth:** 3.2 m

**Bottom type/sediment:** mud (polluted)

**Sampling method:** Van Veen grab

**Tidal phase during sampling:**



**Results:**

No animals found in the sample.

**Sampling station:** 003 **PK:** 231.8

**Date:** December 7, 2005, **time:** 10:25 hour

**Location coordinates UTM/UPS WGS 84** **x-coordinate:** 363.885  
**y-coordinate:** 5467.906

**Map view and picture:**



**General description of the sampling station:**

In the side channel between the Île Potel and île Bouffou

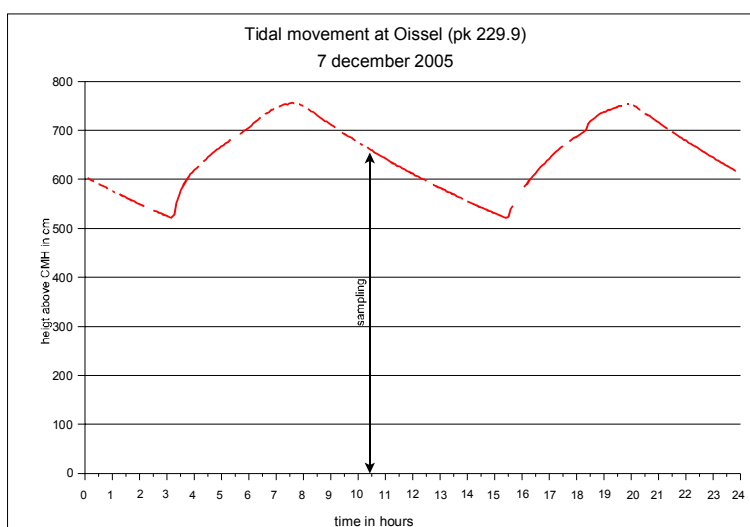
**Habitat:** solid bottom

**Depth:** 4.5 m

**Bottom type/sediment:** solid rock

**Sampling method:** Van Veen grab

**Phase of the tide during sampling:**



**Results:**

Number of animals found in the sample:

Vermes		Mollusca	
Oligochaeta	55	Ancylidae	1
Hirudinea	2	Corbicula	1
		Dreissena	1
		Crustacea	
		Gammaridae	15

**Sampling station:** 004 **PK:** 231.5

**Date:** December 7, 2005 **time:** 10:35 hour

**Location coordinates UTM/UPS WGS 84** **x-coordinate:** 363.764  
**y-coordinate:** 5467.057

**Map view and picture:**

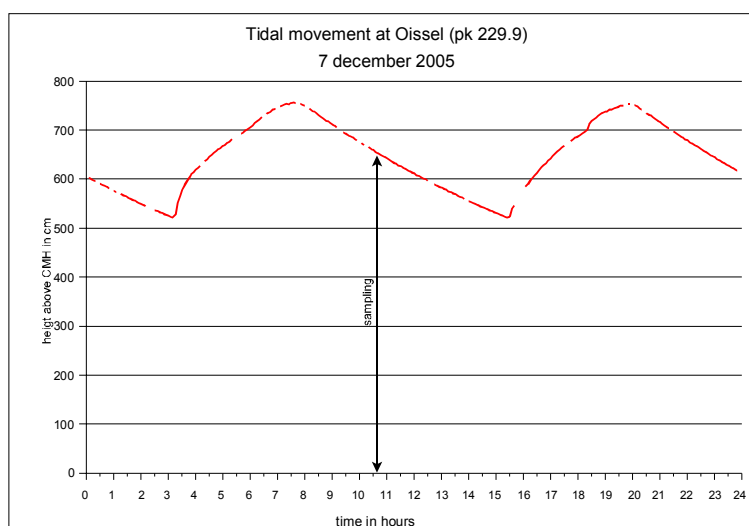


**General description of the sampling station:**  
Small tidal creek on the right bank of the Île Potel

**Habitat:** intertidal zone  
**Bottom type/sediment:** mud

**Sampling depth:** 0.5 m  
**Sampling method:** hand net

**Tidal phase during sampling:**



**Results:**

Vermes	
Oligochaeta	347

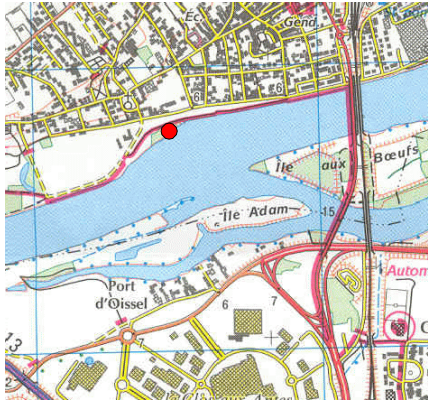
No other animals found in the sample.

**Sampling station:** 005 **PK:** 229.2

**Date:** December 7, 2005, **time:** 11:20 hour

**Location coordinates UTM/UPS WGS 84** **x-coordinate:** 361.458  
**y-coordinate:** 5467.756

**Map view and picture:**



**General description of the sampling station:**

Sandy littoral zone rich of silt at the left bank in the vicinity of Oissel

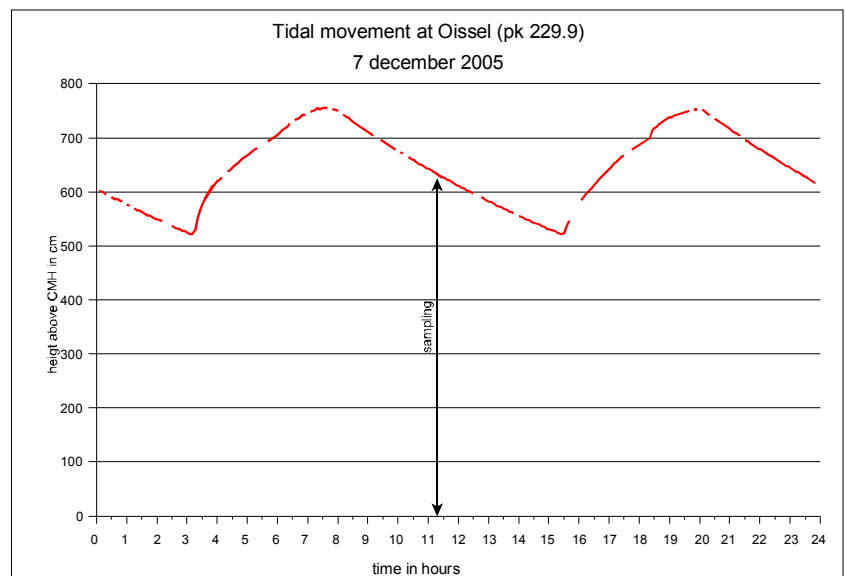
**Habitat:** intertidal silty sand bottom

**Bottom type/sediment:** sand with high silt content

**Sampling depth:** 1-1.5 m

**Sampling method:** hand net

**Tidal phase during sampling:**



**Results:**

Four Corbicula's found during sampling. No other animals found in the sample.

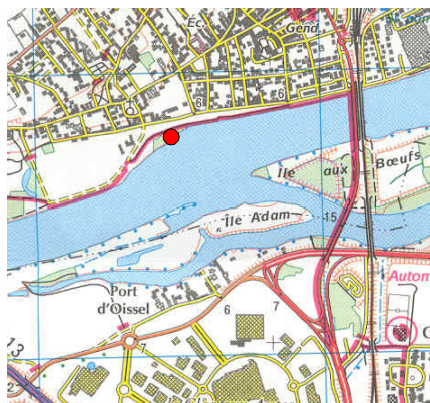


**Sampling station:** 006 PK: 229.2

**Date:** December 7, 2005, **time:** 11:30 hour

**Location coordinates UTM/UPS WGS 84** x-coordinate: 361.458  
y-coordinate: 5467.756

**Map view and picture:**



**General description of the sampling station:**

The iron sheet piling protection of the left bank in the vicinity of Oissel

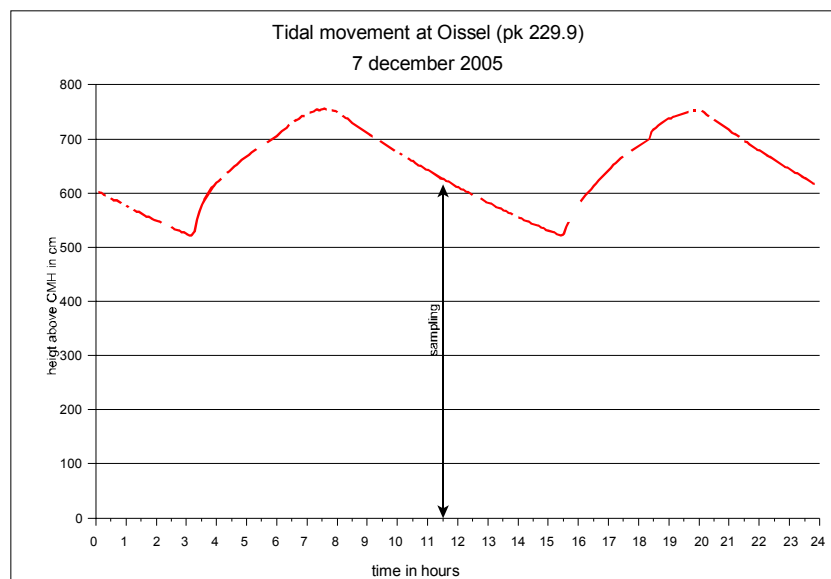
**Habitat:** intertidal part of iron sheet piling

**Bottom type/sediment:** steel

**Sampling depth:** 0.50-1 m

**Sampling method:** hand net

**Tidal phase during sampling:**



**Results:**

No animals found in the sample.



**Sampling station:** 007 **PK:** 256.5

**Date:** December 7, 2005, **time:** 14:15 hour

**Location coordinates UTM/UPS WGS 84** **x-coordinate:** 353.887  
**y-coordinate:** 5469.520

**Map view and picture:**



**General description of the sampling station:**

Intertidal littoral zone on the right bank

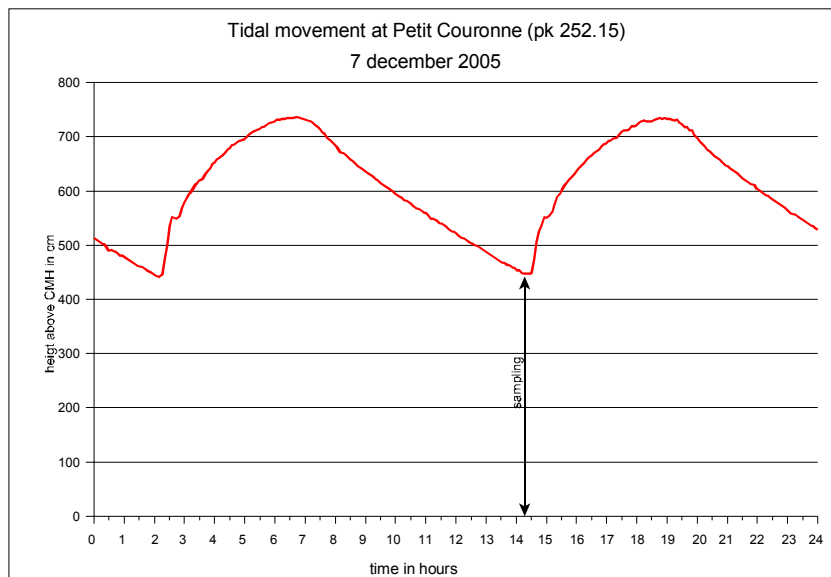
**Habitat:** stones on the river bank

**Bottom type/sediment:** cobbles, pebbles, gravel, sand and mud

**Sampling depth:** 0-0.3 m

**Sampling method:** brushing off stones

**Tidal phase during sampling:**



**Results:**

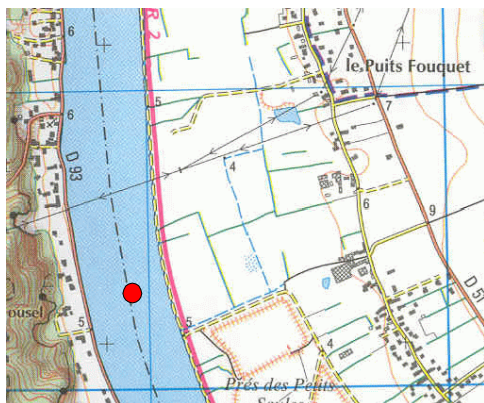
Vermes		Mollusca		Crustacea	
Oligochaeta	90	Lymnaeidae	20	Gammaridae	1
Hirudinea	30	Pisidae	4	Diptera	
				Chironomidae	3

**Sampling station:** 008 **PK:** 261.5

**Date:** December 7, 2005, **time:** 14:30 hour

**Location coordinates UTM/UPS WGS 84** **x-coordinate:** 348.913  
**y-coordinate:** 5470.390

**Map view:**



**General description of the sampling station:**

River channel, center part

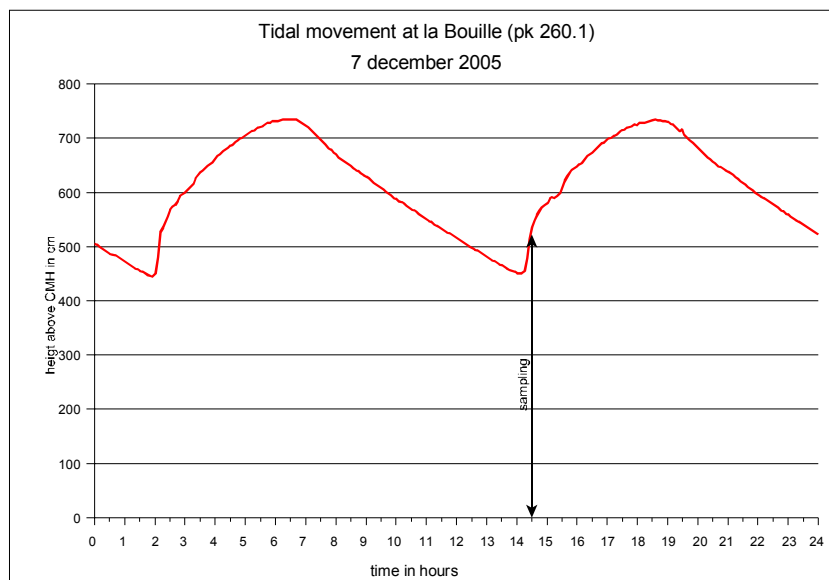
**Habitat:** solid substrate

**Bottom type/sediment:** solid rock

**Depth:** 8 m

**Sampling method:** Triangular dredge

**Tidal phase during sampling:**



**Results:**

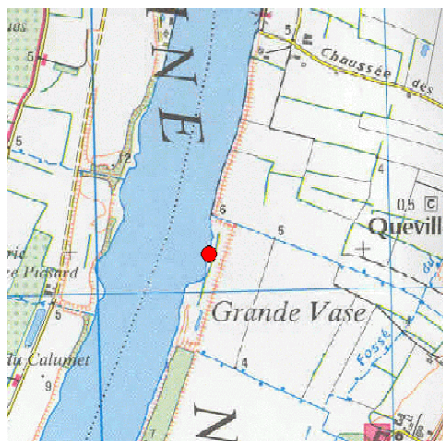
<b>Vermes</b>	
Oligochaeta	324
<b>Mollusca</b>	
Corbicula	40

**Sampling station:** 009 PK: 267.5

**Date:** December 7, 2005, **time:** 15:10 hour

**Location coordinates UTM/UPS WGS 84** x-coordinate: 361.390  
y-coordinate: 5476.152

**Map view and picture:**



**General description of the sampling station:**

Intertidal littoral zone on the left bank. Pebbles, gravel and fine sandy material

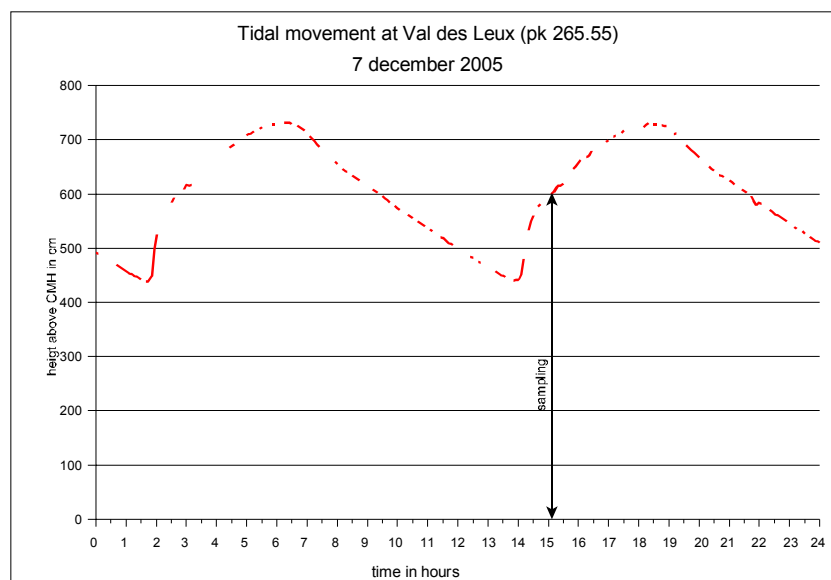
**Habitat:** Sandy intertidal zone

**Bottom type/sediment:** pebbles, gravel and fine sandy material

**Sampling depth:** 0.5-1 m

**Sampling method:** hand net

**Tidal phase during sampling:**



**Results:**

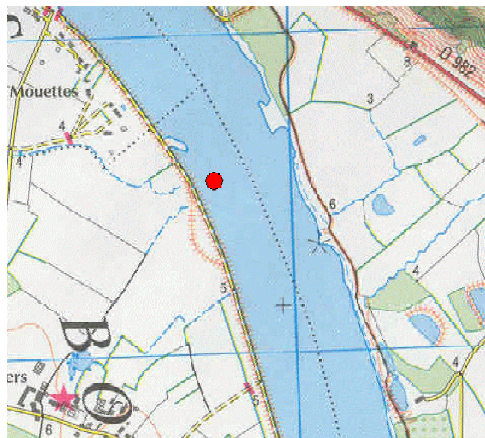
No animals found in the samples.

**Sampling station:** 010 PK: 274.1

**Date:** December 7, 2005, **time:** 15:30 hour

**Location coordinates UTM/UPS WGS 84** **x-coordinate:** 349.859  
**y-coordinate:** 5482.647

**Map view:**



**General description of the sampling station:**

Sand bar beside the main channel near the left bank

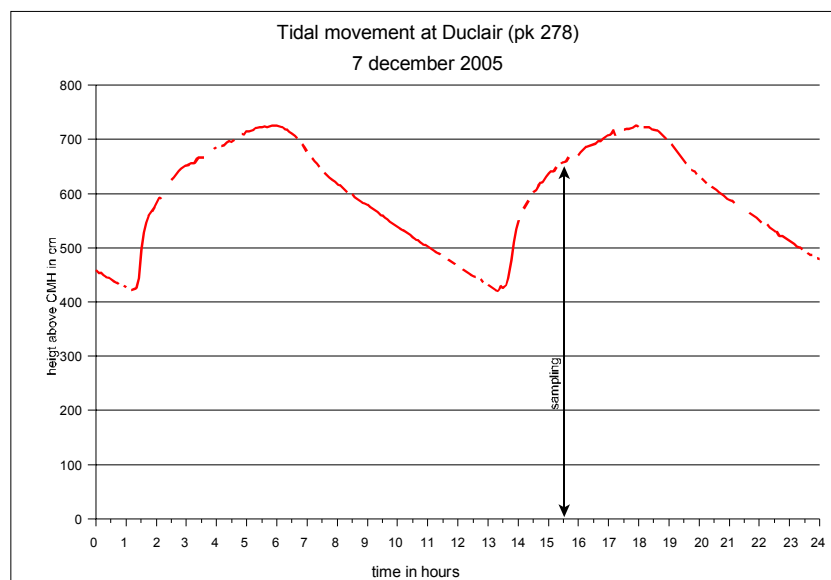
**Habitat:** sandy mud

**Bottom type/sediment:** sandy mud

**Depth:** 2.5 m

**Sampling method:** Van Veen grab

**Tidal phase during sampling:**



**Results:**

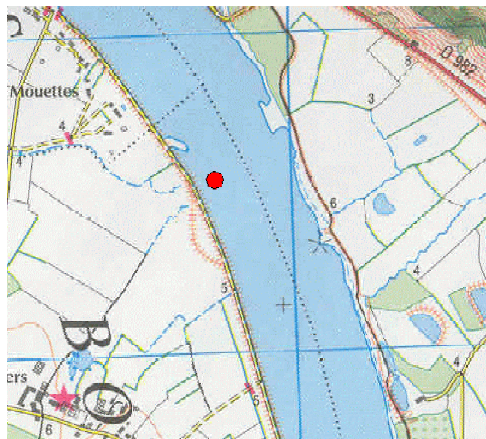
Vermes	
Oligochaeta	9775

**Sampling station:** 011 PK: 274.1

**Date:** December 7, 2005, **time:** 15:30 hour

**Location coordinates UTM/UPS WGS 84** **x-coordinate:** 349.859  
**y-coordinate:** 5482.647

**Map view:**



**General description of the sampling station:**

Sand bar beside the main channel near the left bank

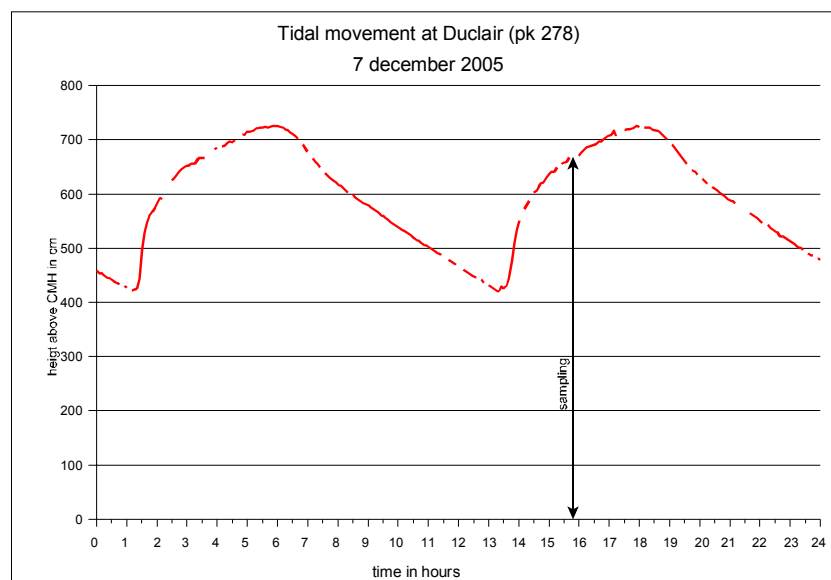
**Habitat:** sandy mud

**Depth:** 11 m

**Bottom type/sediment:** sandy mud

**Sampling method:** Van Veen grab

**Tidal phase during sampling:**



**Results:**

<b>Vermes</b>	
Oligochaeta	12
<b>Diptera</b>	
Chironomidae	3



**Sampling station:** 012 PK: 325.7

**Date:** December 8, 2005, **time:** 10:00 hour

**Location coordinates UTM/UPS WGS 84** **x-coordinate:** 327.000  
**y-coordinate:** 5477.770

**Map view and picture:**



**General description of the sampling station:**

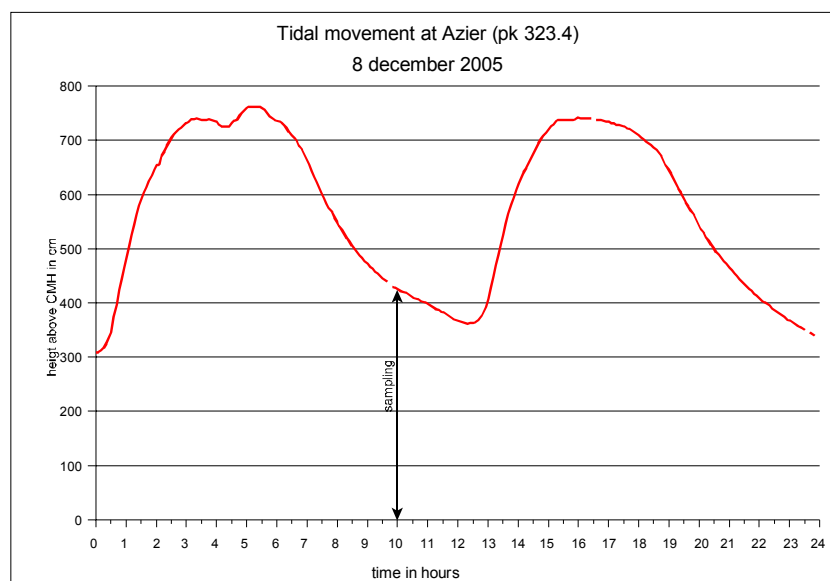
Fresh water intertidal area with mud banks and gravel beaches on the left bank. Several patches of intertidal vegetation. Lowest part reinforced with concrete, asphalt and stones.

**Water temperature:** 7.7 °C,  
**Salinity in psu:** 0.1

**Habitat:** intertidal mud bank,  
stones, gravel  
**Depth:** 0-0.3 m  
**Bottom type/sediment:** mud,  
stones, gravel

**Sampling method:** brushing off  
stones, hand net for both  
muddy habitats and gravel<sup>1</sup>

**Tidal phase during sampling:**



**Results:**

	stones	handnet kick sample	intertidal mud low <sup>2</sup>	intertidal mud high <sup>3</sup>
<b>Vermes</b>				
Oligochaeta	43	430	504	15750
<b>Crustacea</b>				
Gammaridae	1			
Palaemonidae		3		
<b>Diptera</b>				
Chironomidae	4			

<sup>1</sup> Kick method

<sup>2</sup> The site was located close to the low tide water level.

<sup>3</sup> The site was located about half way the level of high and low tide.



**Sampling station:** 013 **PK:** 303.7

**Date:** December 8, 2005, **time:** 13:50 hour

**Location coordinates UTM/UPS WGS 84** **x-coordinate:** 338.930  
**y-coordinate:** 5484.177

**Map view and picture:**



**General description of sampling station:**

Rip rap on the right bank at a former dike ramp in the vicinity of Les Maisons Blanches

**Habitat:** intertidal stones

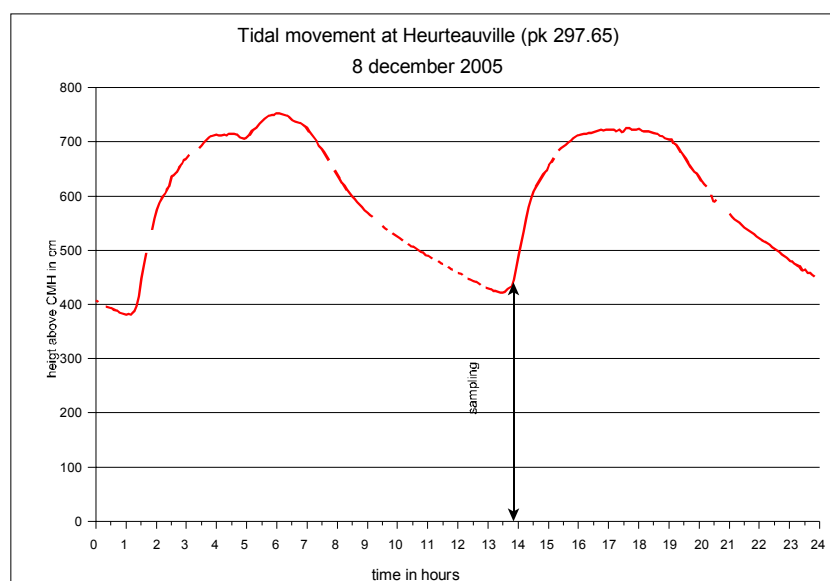
**Depth:** 0-0.4 m

**Bottom type/sediment:** stones overgrown with algae and covered with mud

**Sampling method:** brushing off stones



**Tidal phase during sampling:**



**Results:**

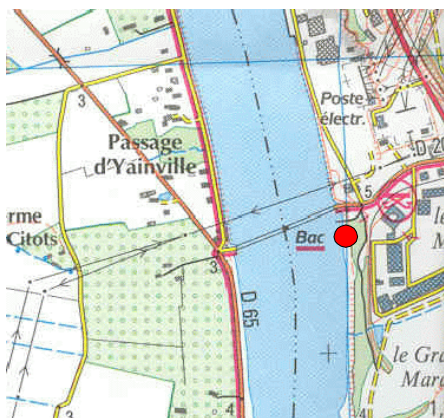
<b>Mollusca</b>	
Dreissena	13
Lymnaeidae	1

**Sampling station:** 014 **PK:** 299.6

**Date:** December 8, 2005, **time:** 14.30

**Location coordinates UTM/UPS WGS 84** **x-coordinate:** 341.992  
**y-coordinate:** 5480.595

**Map view and picture:**



**General description of the sampling station:**

Gravel beach with large stones changing into mud flat towards the river on the right bank upstream of the ferry (Passage d'Yainville)

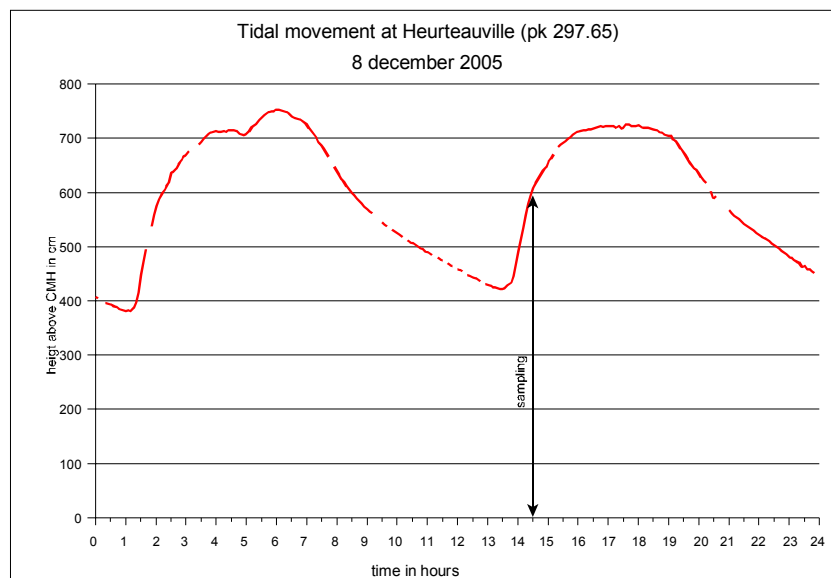
**Habitat:** intertidal mud bank, stones

**Depth:** 0-0.3 m

**Bottom type/sediment:** mud, stones

**Sampling method:** brushing off stones, hand net for muddy habitat

**Tidal phase during sampling:**



**Results:**

	stones	mud
<b>Vermes</b>		
Oligochaeta	36	4

## 4. Final remarks

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The results presented in this interim report are the results of a quick scan made with the intention to get an impression of the freshwater tidal section of the River Seine. They do not reflect the macrozoobenthos community in that part of the river, but only give an idea of dominant species in main biotopes. In addition a picture was obtained of the physical structure of these biotopes.

The insight in the freshwater part of the river Seine estuary gained with the quick scan, together with the demands and the information provided by GIP-Seine Aval and the Port of Rouen were essential to elaborate the sampling protocol for the study of the macrobenthos of this part of the river. The sampling took place from the 15th till the 20th of June 2006 and the results and analyses will be published elsewhere.