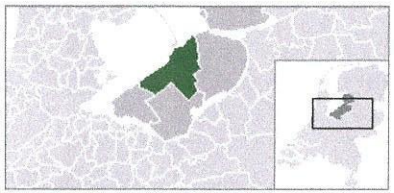
Field trip 29 May 2009: Short guide to sites

10 years
ECRR Network

Introduction

The seminar participants will visit different sites in the provinces of Flevoland and Overijssel.
The map shows all sites described in this brochure in an overview.
The red dots show the following sites.

1) The City of Lelystad – start by bus
2) Aboard the Ferryman at the Lake Ketelmeer
3) The deposit for dregded materials «Keteloog»
4) The flexible weir – at Ramspol brigde
5) The Nature Development project in the IJsselmouth
6) At the mouth of the river IJssel
7) The spatial project IJsseldelta
8) The floodplain Vreugderijkerwaard
9) The city of Kampen – embarking



Site 1

Lelystad is the capital of the youngest province of the Netherlands called Flevoland and area-wise the largest municipality in the Netherlands. The city was founded in the polder Eastern Flevoland in 1967. The city, built on reclaimed land, was founded in 1967 and was named after a famous Dutch civil engineer Cornelis Lely, who engineered the barrier dam (closing of the former Zuiderzee from the North Sea), making the reclaiming of the IJsselmeerpolders possible. Lelystad is approximately 5 meters (16 ft) below sea level. The map above of this kolumn shows the province of Flevoland and the municipality of Lelystad.

The honeycomb grid in the arms of Lelystad pictures the dikes, built with six-edged concrete or basalt blocks. The color gold indicates the high costs of the project of making the polder. The center shield is the arms of engineer Cornelis Lely. The sea lions reflect the history of the land.

In the flag of Lelystad, the Fleur-de-lis (lily) takes a central point, referring to the name Lely. The yellow (golden) background reflect the precious land, and the blue lines the dikes and waterways.

Lelystad is area-wise the largest municipality in the Netherlands. A big part of that area is water: Markermeer and IJsselmeer. Another major area is the internationally famous nature park Oostvaardersplassen which spontaneously grew when the polder of *South Flevoland* was drained. Lelystad is also surrounded by a square of woodlands and parks and flat farmland. The location of the city makes weather and skies especially beautiful. The importance of the landscape and sky is emphasized by several pieces of land art: engineers' work and arts like the *Observatory* by Robert Morris.

Lelystad is built on the seabottom of the former Zuiderzee. About 6500 years ago this wetland was above the high tide level and inhabited; the Netherlands have steadily subsided since. Nearby Lelystad at Swifterbant, the oldest human skeletons in Western Europe were discovered. Due to rising water levels and storms, the peatlands were washed away, and the Lacus Flevo (Roman times) grew to be the Almere (Middle Ages) and became the Zuiderzee. The Zuiderzee (Southern Sea) was the main transport route from Amsterdam to the North Sea and the Hanseatic League cities. Thanks to the many shipwrecks in Flevoland, Lelystad now houses the National Centre for Maritime History, with a museum and the shipyard that has built the Batavia replica.

After World War II the Zuiderzee Works continued by making the polder of Eastern Flevoland. In 1950 work commenced on several construction islands in the middle of the IJsselmeer. Lelystad-Haven was the largest island, and its wooden barracks housed a community of dike-builders. In 1955 they reached the mainland, which made it possible to drive to Lelystad by car. One of the three Pumping stations, which drained the polder in June 1957 was the diesel powered Wortman in Lelystad-Haven. Until 1967 the only inhabitants of Lelystad were technical engineers and workmen and superintendents, living on the former construction-island. For more information on Lelystad's history, you can visit the Nieuw Land Heritage Centre near Batavia harbour.

The bus drive from Lelystad to the boarding location takes about 45 minutes. The drive goes through the agricultural fields of Eastern Flevoland.

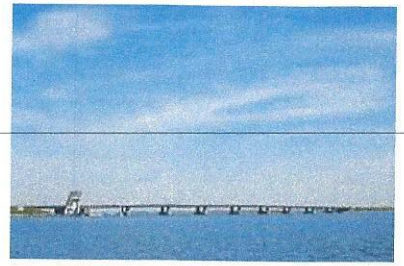
Eastern Flevoland is reclaimed land from the Zuiderzee period. Eastern Flevoland (Oostelijk Flevoland or Oost-Flevoland) and Southern Flevoland (Zuidelijk Flevoland or Zuid-Flevoland), unlike the Noordoostpolder, have peripheral lakes between them and the mainland: the Veluwemeer and Gooimeer respectively, making them, together, the world's largest artificial island.

They are two separate polders that have a joint hydrological infrastructure, with a dividing dike in the middle, the Knardijk, that will keep one polder safe should the other be flooded. The two main drainage canals that traverse the dike can be closed by weirs in such a case. The pumping stations are the Wortman (diesel powered) at Lelystad-Haven, the Lovink near Harderwijk on the mainland and the Colijn (both electrically

powered) along the northern dike beside the Ketelmeer.

Site 2

Going aboard of the "Ferryman of Kampen" on a quay along the Lake Ketelmeer.



You can see the big bridge (see picture moveable bridge part) that connects the Northeast polder with Eastern Flevoland. Over the bridge runs a major north-south highway in the Netherlands. Car drivers are sometimes not so happy with waiting for the open bridge while sailing ships are crossing!!

Site 3

The Ketelmeer disposal site for dredged materials is also called Ketelmeer-eye and lies in the middel of the border lake. You can imagine from the aerial view why the depot has got this name.

The heavily polluted bed of the Ketelmeer Lake had to be cleaned up. A deposit was built in the Ketelmeer itself for the storage of the dredged sludge. The advantage of this island deposit is that it saves space on land and does not cause any nuisance to local residents.

The dyke around the deposit was built with sand recovered during the excavation of the 45 metre deep deposit. The 10 metre high dyke is sealed on the inside with a film to prevent the contaminated sludge from being washed away. A circular dyke, one kilometre in diameter, was selected to ensure that contact with the surroundings is kept to a minimum.

Space for nature development is available in the surrounding of the Ketelmeer deposit. The picture shows this new nature in the Lake Ketelmeer with upcoming willow trees of different age along the shoreline.

Site 4

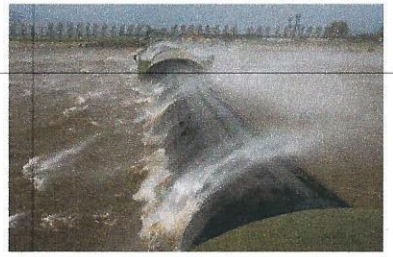
The flexible weir at Ramspol Bridge can be seen from the aerial picture.

The flexible weir is a weir that was installed to protect the region of West-Overijssel against high floods. The problem in the Lake IJsselmeer are the western winds at high water levels in the lake which can cause a high seiches (waves) even in the western part of the Lake Ketelmeer up to the Zwarte Water.

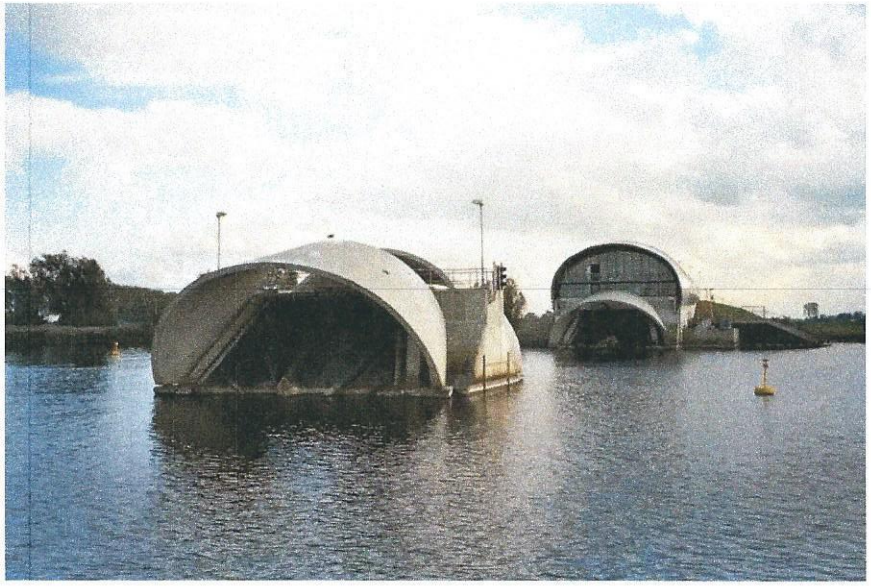
The weir is made of 3 enormous parts of rubber tubes that are filled up with water and air while high waters are up coming. The construction can be compared with a giant balloon. The construction raises partly above the water surface but the textile part is hidden under the water. The weir has a diameter of 8 metres and is therefore the biggest one in the world of this type.
When the flood danger is gone, the textile tubes will be emptied and the tubes lie again on the bottom of the lake, so that

shipping has no constraints and that the landscape view is not disturbed very much. It was expected during planning that the weir would be used about once a year. The first use of the weir was done in October 2002.

Since that time the weir has been used 12 times to overcome floods in the hinterland.



A recent risk analysis of the water board Zuiderzeeland has shown that a failure in functioning is likely to occur one time per 1000 closures.
The weir was produced in Japan. The time needed to close the weir is 60 minutes at maximum. Emptying the tubes takes 180 minutes at maximum.



Site 5

The nature development project of the IJssel-mouth with man-made nature islands is situated in the eastern part of the Lake Ketelmeer. This big-scale nature development project was carried out between 1997 and 2002. The idea of the regional water manager was to realise the shape of a large-scale riverine natural delta at the mouth of the river IJssel.
In order to create the artificial river islands – dams and sediment were needed. The sediment material derived from dredging activities to deepen the shipping ways in the surrounding waters.
About 1 million cubic metres of sand and another 1 million cubic metres of clay and peat were used. To construct the islands, a ring quay was installed with clean sand (this means without contaminants).
The sometimes very strong winds coming from westerly direction made it necessary to use some rocks to avoid extreme erosion of the sand.
The inner parts of the river islands were filled up with slightly contaminated soils that were spout up directly by the dredging ships. Subsidence processes in the meantime have led to more dynamics in the area by the development of some openings in the quays. The ambition concerning the vegetation development on these river islands is common reed. The growth of too many willows is not wanted. Therefore the composition of the soil is very important.

Today the whole area is designated as Natura 2000 area. The area with swamps, reed vegetation and shallow waters is an important area for many bird species.

Valuable are the land-water shore zones in the greater Lake IJsselmeer area and the resting places on the islands.

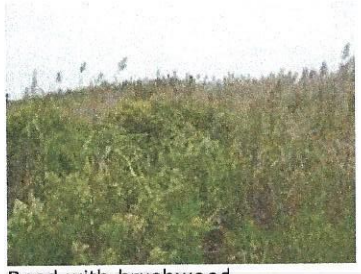
The images show the quays around the island and than the sediment coming in.

Some examples of the various development of the river island are presented. The diversity offers habitats for many different species.

Shallow water with aquatic plants

Pioneer vegetation with swamp ragwort

Common reed vegetation



Reed with brushwood

Mozaiek of reed, grasses, brushwoods and bushes

Site 6

The mouth of the river IJssel comes out nowadays in the fresh water Lake Ketelmeer. The river IJssel is the northern branch of the River Rhine in the Netherlands Rhine in the Dutch provinces of Gelderland and Overijssel.

The IJssel is not that much channelised and straight-enend like the main shipping route – the River Waal. That is the Rhine branch running from almost the German border to the main ports of Rotterdam.

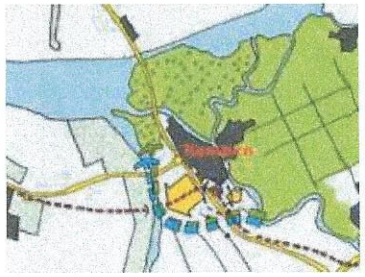
River IJssel flows from Westervoort, east of the city of Arnhem, until it discharges into the IJsselmeer ("Lake IJsselmeer", until the 1932 completion of the Afsluitdijk known as the Zuiderzee, a North Sea inlet). River IJssel is one of the three major distributary branches into which the Rhine divides itself shortly after crossing the German-Dutch border, the other two being the rivers Nederrijn and Waal. The average discharge of the IJssel can change significantly. The average discharge has been stated as 300 cubic meters per second. This can be as low as 140 m^3/s and as high as 1800 m^3/s, depending on the Nederrijn locks west of Arnhem, which regulate the amount of water taken in by the Nederrijn and IJssel branches.

As a lowlands river, the IJssel has a lot of bends and naturally occurring dead branches (locally called "hank"); some bends have been cut off by man (most notably near Rheden and Doesburg), reducing the river's length from 146 km to 125 km, but not nearly as radically as with river Meuse. The naturally occurring phenomenon of sedimental island-forming in the outside of bends has been regulated to the point of non-occurrence since the late nineteenth century.

Site 7

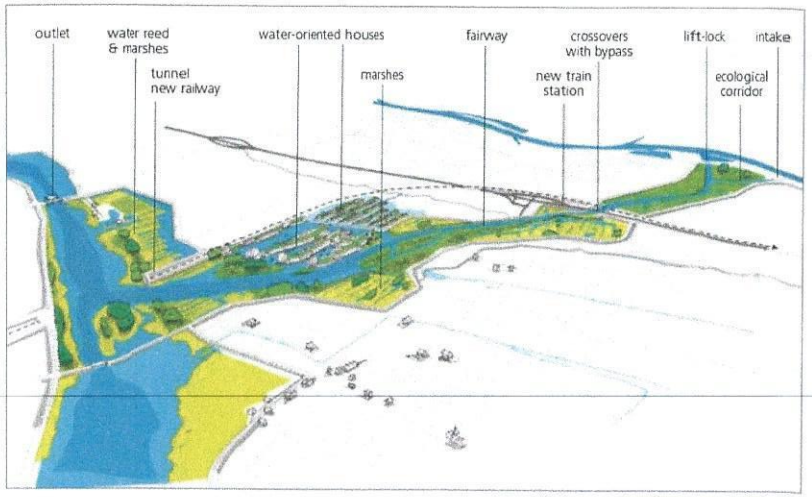
Spatial planning in the IJsseldelta is necessary to reach climate adaptation in future. The IJsseldelta is a low-lying area that is threatened by floods coming from both the river IJssel and from the Lake IJsselmeer. While sailing on the boat on the river Ijssel you can see, that the farm houses and buildings in this area are built on small mounds in order to keep the people and the animals dry in times of (former) floods.

The delta area is now protected from flooding by dikes but the safety standards in the IJsseldelta with the major cities such as Zwolle and Kampen cannot be guaranteed in the near future because of the effects of climate change. Model predictions indicate that the high water level in the river IJssel will rise up to 40 cm in 2015 and up to 1m in the long term (~2100).



The IJsseldelta must therefore get prepared for the future. This is done by sustainable development in planning. A Masterplan for the area was published in 2006 and was discussed with the public and stakeholders. Based on the outcomes the current plan was made (see figure). The plan will cope with the 6 spatial challenges such as housing, infrastructure, leisure, nature, agriculture and river bypass in the area that will be combined and integrated.

Water plays a central role in the plan-making process. Water dynamics are an important motor for nature development. Frequent inundations can create special habitats e.g. that are important spawning areas for fish species. Dutch water managers have learned about the effects on natural water dynamics in Lake Peipsi through a joint cooperation with Estonian and Russian specialists.



Site 8

The Vreugderijkerwaard Floodplain lies at the east side of the river IJssel.

This nature development project started in 1999. The creation of a secondary channel (1,8 km long) should bring back a bit more riverine dynamics into the typical grassy Dutch floodplain. The secondary channel was designed and implemented in July 2002. In total about 450.000 cubic metres of sediment were digged out.

The 130 hectares floodplain is now characterised by more diversity and has shallow banks along the channel that are very attractive to birds.

The restoration project was possible because of the purchase of agricultural land in this floodplain. A big farmer was giving up his business by that time because of the floods in the Rhine catchment in 1993 and 1995.

The part close to the river was already managed by a Dutch nature NGO called "Natuurmonumenten" since 1962. In that area river dunes dating from after the last ice age occur that are very valuable from geomorphologic and botanical point of view.

The area is attractive for people to just walk along the floodplain or to watch birds from the dike. Walking paths, bicycle paths and an observation hut wer constructed in order to increase the leisure activities.

In the floodplain there are still living some people. The inhabitants can reach their houses through the inlet regulation structure. At high

waters the houses can just be reached by boat.
The inlet structure was necessary in order to keep enough water in the main river for shipping purposes.

Further floodplain projects were implemented in the last years in the national programme "Room for the River". The basic measures of the programme will be implemented by 2015 and the Dutch government has a budget of 2.2 billion Euro available.

Location 9

The city of Kampen is situated along the river IJssel close to the point where it flows into the IJsselmeer (formerly the "Zuiderzee"). Opposite of Kampen, along the IJssel, lies IJsselmuiden, which is the second largest town of the municipality Kampen.

Kampen received city rights in 1236. It joined the Hanseatic League around 1440 and it used to be an important port. The population of the city as of 2007 was 49,345. Kampen has one of the best preserved

old town centres of the Netherlands.

Notable buildings/structures are: the three bridges spanning the IJssel which connect Kampen with IJsselmuiden, a mill (*d' Olde Zwarver*), numerous churches (*St. Nicolas church*).

The city is the home harbour of our ship. We embark here and travel back by bus to city of Lelystad.

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Please refer to our website: www.ecrr.org

Questions ? Please contact :

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The information that is summarised in this brochure related to the field trip was collected from various documents and websites, but mainly written in Dutch language. Therefore those links won't help you in understanding things better. Layout developed by Albert Remmelzwaal.

If you like to know more about some issues or sites please contact me my e-mail.

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