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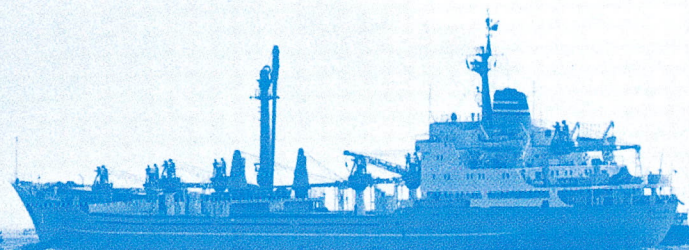
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Western Scheldt Policy Plan



Working together towards a balance

"Now we must take up the challenge of building a new attitude towards the environment, a new relationship characterized by respect for ecological balance, cautiousness and meticulous management." These words were spoken by Queen Beatrix of the Netherlands during her Christmas address. Over the past decades the Western Scheldt, an estuary with a multitude of functions, has been thrown off balance and it has now become necessary to take immediate measures to redress this balance. The Western Scheldt policy plan is the solution to the problem.

The policy plan for the Western Scheldt officially came into effect when all the administrators involved signed a management agreement on 22 October 1992. An integrated organization and management policy for the Western Scheldt estuary area has been pursued, however, ever since provisions for the policy plan were made back in March 1991.

Many years of consultations, detailed studies, memoranda and much deliberation and participation amongst all parties involved have preceded this purposive policy plan.

The Western Scheldt was (and still is) in poor shape. For centuries nature, shipping and fishing functioned in harmony in the estuary until drastic changes started to take place in the fifties of this century. Industrial and harbour activities, dredging, waste water emissions, reinforcement of water-control structures and an increase in shipping and recreation threatened the area. In short: emissions plus the necessary dredging activities to maintain the required fairway depth were polluting and clouding the water. Dikes and banks beaching were threatening the natural environment and recreation, shipping and sand dredging and other activities were disturbing the peace. It was time for all those authorities involved in the area to join forces in order to achieve optimum management of the estuary and its surroundings. Which is why the state, province, bordering municipalities and water authorities all decided to draw up a policy plan for the Western Scheldt estuary area in 1986. The policy plan aimed to unite the interests of all those involved to ensure that the Western Scheldt now, and in the future, remains a valuable area of natural beauty - just as it was in the past.



Management consultation

Quite a few agencies are involved in the management consultations concerning the Western Scheldt. To give you a clear picture these are: the Ministries for Housing, Physical Planning and Environment, Economic Affairs, Transport and Public Works, Agriculture, Conservation & Fisheries and finally the Ministry of Finance. Further the provincial administration of Zeeland, the municipal

councils of Borsele, Hontenisse, Hulst, Kapelle, Oostburg, Reimerswaal, Sluis, Terneuzen, Valkenisse, Vlissingen and Westkapelle and the water authorities De Drie Ambachten, Het Vrije van Sluis, Hulster Ambacht, Noord and Zuid-Beveland and Walcheren. The interests of both harbour authorities along the Western Scheldt are promoted by the province.

Main objective

The main objective of the policy plan officially states: "The creation of a situation whereby the environment can be conserved and restored whereby, furthermore, potential natural assets can be developed, taking into consideration the function of shipping in the region, coupled with sea port and industrial activities. This policy should also form a solid foundation for the development of fishing and recreation facilities. The importance of water-control structures should also be safeguarded."

In order to achieve these objectives short-term and long-term policies have been developed.

approximately 56 kilometers. The area is some 500 meters wide near Antwerp and approximately 4.5 kilometers wide at Vlissingen. The maximum width, at Sloehaven, is 7.8 kilometers and the lowest depth is some 57 meters in the vicinity of Borsele. The estuary and its water-control structures fall under the planning area.

Sea-defence structures

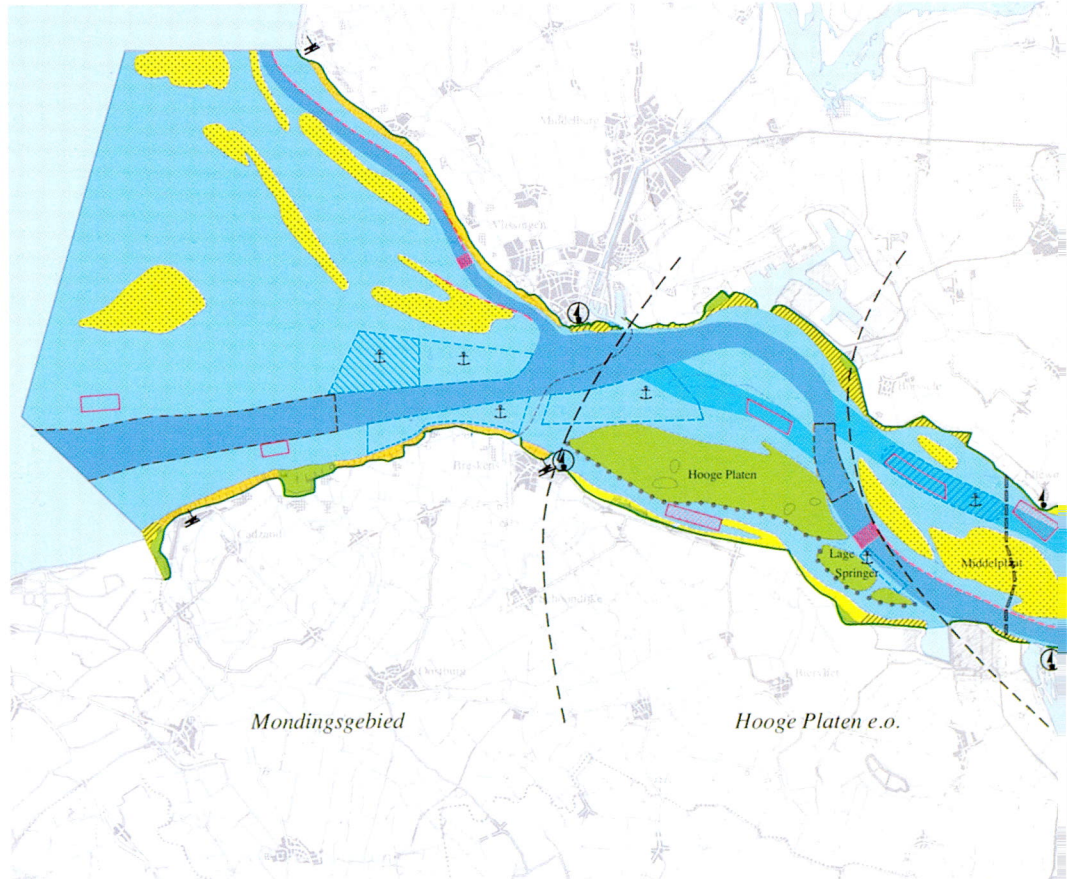
The sea-defence structures have been at minimum safe height since 1991. The rise in the sea level, estimated at 22 centimeters per century, is not expected to have any effects during the planning period. A slight increase in tidal range is anticipated.

Planning area

The area of Dutch soil covered by the plans extends from the Western Scheldt estuary to the border with Belgium and sea dikes form the northern and southern boundaries.

The distance between the Dutch-Belgian border and Vlissingen (Flushing) is

The planners have divided the area into various zones as shown on this map.



Zoning and management

Different factors play a major role in the different areas of the Western Scheldt. The area has been divided up into zones in order to facilitate better links between the existing functions and activities per zone.

The natural course of the Western Scheldt is diminishing from west to east due to the dredging of the navigation channels. If the Western Scheldt is deepened further then a form of channelization will occur and the natural dynamics of the waterway will decrease further. On the other hand, in the western area, there is far more space for preserving the natural processes accompanying tidal waters.

Salinity levels and nutrient levels also vary and these too influence the vegetation and fauna and the same is true for the pollution of the water and the river bed.

The western region of the Western Scheldt is also far more attractive in terms of recreation than the eastern region. All these differences have been taken into consideration in drawing up the policy plan.

Four regions

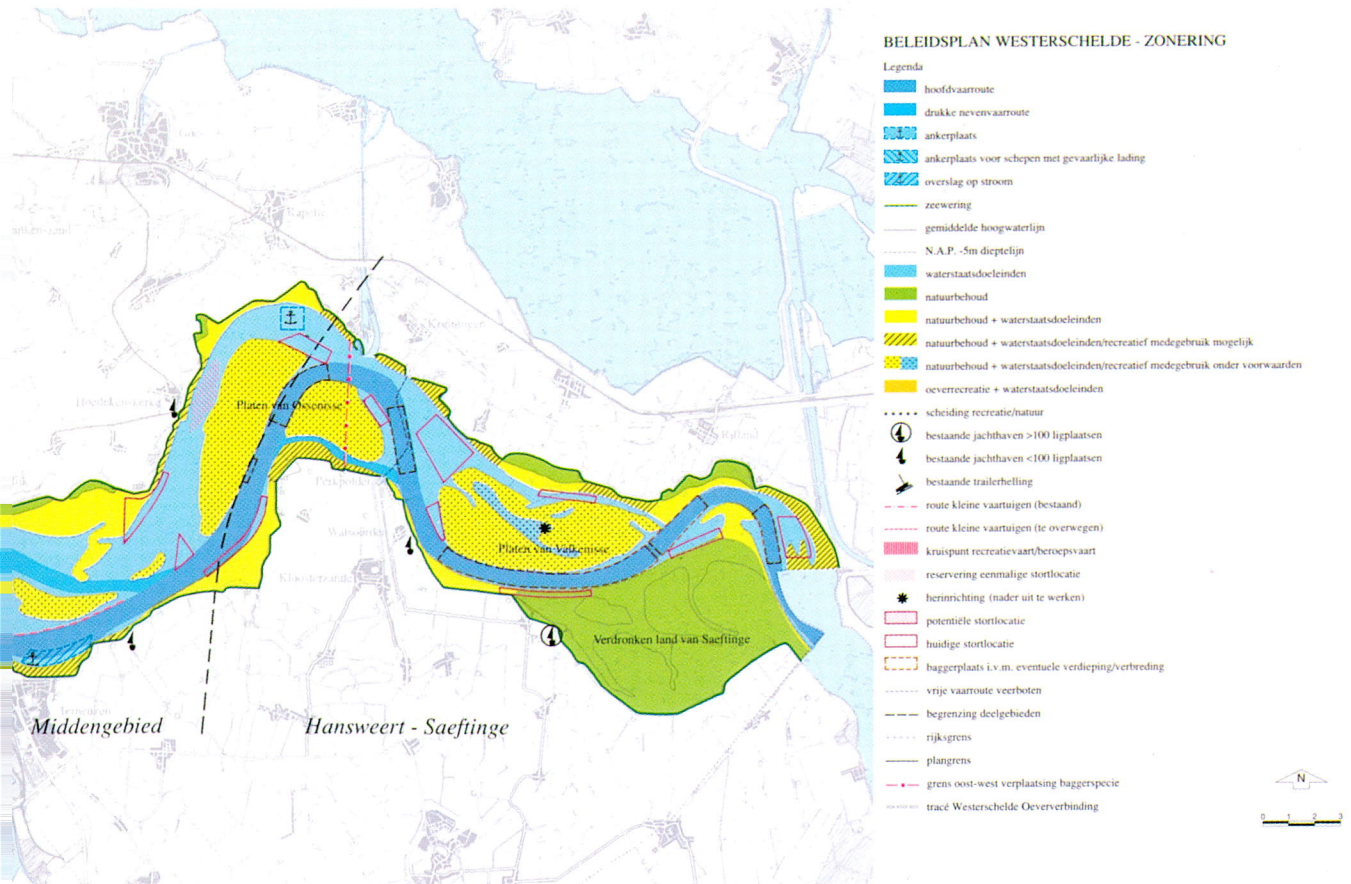
With reference to functional allocation and differences in character, the Western Scheldt is divided up into four regions namely the Mondingsgebied, Hooge Platen and environs, Middengebied and the Hansweert-Saeftinge region.

The Mondingsgebied has good water quality when compared to the eastern region. The natural dynamics of this area, with shallows and channels have not been disturbed greatly by outside influences and the beaches are of international consequence in terms of recreation.

Hooge Platen and environs is of high natural value, particularly the Hooge Platen complex and Paulinaschor, but shipping plays an important role here too. The water and river bed are relatively unpolluted.

The Middengebied is a transition area as far as water quality is concerned.

Fixing the waterway in the eastern part of the Western Scheldt, in the Hansweert-Saeftinge region, is rather unnatural and the water is cloudy due to





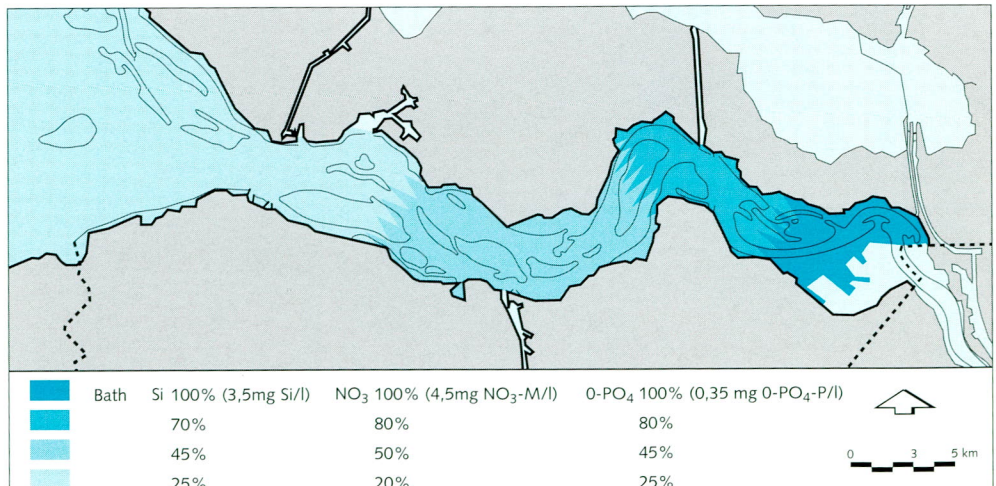
1. Hooge Platen is an area of outstanding natural value, yet it is also a busy shipping route

extensive dredging and dumping activities north of the Saeftinge scenic area. The major cause of pollution of the river bed is the supply of polluted Scheldt water. The aim here is to dredge the waterway as little as possible and to give nature a helping hand in other areas.

Fresh and salt water

One typical characteristic of the Western Scheldt is the varying degree of salinity arising from the changes in the mixing ratio between the salt seawater and fresh river water. As one would expect, the saline level is influenced the most in the east by rivers and the Bathse discharge sluice; the level decreases slowly to the west.

Figure 1. Course of nutrient content in percentages compared with the nutrient content at Bath, 1989.



Interested parties

Shipping dominates the Western Scheldt (approx. 40,000 passages per annum) as do the industrial regions of Vlissingen, Terneuzen and Antwerp. Quite naturally, therefore, shipping and the water-control structures have played, and continue to play, a major role in physical planning.

In an ecological sense, the Western Scheldt is of great international importance for water birds because it is located on a migration route and serves as a wintering and foraging area. The river fulfills one further function, it acts as a so-called "nursery" for fish (especially sole and shrimps).

Ebb and flood play a prominent part in river life, creating a valuable wildlife area with salt marshes, mud flats and shallows alternating with deep tidal channels. "Het Land van Saeftinge" for example is the largest continuous brackish-water, salt marsh area in north-west Europe.

Many species of fish have vanished from the Western Scheldt due to the poor quality of water. In consequence these species are no longer fished. In the western area and in the sea-coastal-area eels, shrimps, cockles and sole are fished professionally.

The Western Scheldt is also important in terms of leisure activities.

Behind the North Sea beaches of Walcheren and Zeeland Flanders lie extensive accommodation/recreation complexes with a total of 72,000 beds. Eight yachting basins presently offer approximately 1,250 moorings.

Problems and conflicts

It is logical that in an area in which wildlife, shipping, industry and recreation play such a significant role all kinds of problems arise. Industrial emissions, household waste water and polder water overtax the natural capacity of the Western Scheldt and this in turn upsets the food chains in the water, in the river bed and in the salt marshes. Further it leads to a reduction in the number of species of living creatures especially in the eastern area and a disturbance in the growth of salt marsh vegetation. Illustrative of this is the higher proportion of cancerous growths detected in flounders in the Western Scheldt in comparison to those fished in the Eastern Scheldt. And mussels and sea vegetation are no longer fit for human consumption. It is also not always advisable to swim in some areas in the east.

2. Het Land van Saeftinge is the largest continuous brackish-water/salt marsh area in north-west Europe



Table 1.
Overview of the
functions and activities -
and the conflicts arising
from them - in the
Western Scheldt area.

- : current conflict
0 : potential conflict
(-) : local current conflict
+ : no conflict

Functions and activities		disadvantaged functions/activities									
		Catchment surface water	Discharges	Waterway maintenance	Shipping traffic	Mineral extraction	Shore recreation	Water sport	Water-control structures	Space used for industrial purposes	Nature (professional) shipping
causers of conflicts	Catchment surface water ²⁾		+	+	+	+	+	+	+	+	+
	Discharges: (industrial discharges, polder water discharges, domestic waste discharges and diffuse emissions)	-		+	+	+	-	(-)	+	+	-
	Professional shipping: o maintenance/improvement of waterway o shipping traffic	- 0	+ +	 +	+ +	+ +	0 0	+ +	- +	+ +	- 0
	Mineral extraction	0	+	+	+		0	+	+	+	0
	Shore recreation	+	+	+	+	+		+	0	+	(-)
	Water sport	0	+	+	0	+	+		+	+	(-)
	Water-control structures	+	+	+	+	+	+	+		+	(-)
	Space used for industrial purposes	+	+	+	+	+	+	+	+		0
	Nature	+	+	+	+	+	+	+	+	+	
	(Professional) fishing	+	+	+	+	+	+	+	+	+	(-)

Divergent interests

The Western Scheldt is - as already stated - essential for shipping and industry. The river must be easy to navigate and the harbours must be accessible. Continual maintenance and improvement of the waterway upset the ecological balance and fish life. The inter-tidal area was becoming smaller and this was also affecting for the water-control structure.

Existing and anticipated conflict situations between all the various interested parties could not and cannot be avoided. Further examples include industries wishing to expand in valuable wildlife areas, pleasure craft obstructing

professional shipping, mineral extraction (sand and shells) which threaten wildlife and hamper leisure sportsmen and fishing and cockle fishing which disturb the organisms in the river bed and cause food shortages for water birds.

The planners have had to take all these elements into consideration. All the conceivable and existing conflict situations have been charted as revealed in this survey.

²⁾ This refers to the function of the Western Scheldt as a catchment area and means of transportation for out-flowing river water, industrial and other waste water, polder water etc. within the limits of the natural (carrying) capacity of a sustainable and stable eco-system.

New policies for solving old problems

How to cope with all these conflicting situations? How does one create a balance in view of all these divergent functions? In the first place it was decided to solve the existing problems already observed, and secondly to try to avoid further conflicts in the future. This requires measures taken on several fronts, environmental planning and management for example. These measures are directed at the conservation and where possible restoration of natural assets, the sanitation of emissions and safeguarding wildlife areas outside the dikes. And in all this the demands and needs of shipping, harbours

and industry must be taken into consideration. Of course it is not possible to influence activities on Belgian territory from here but a representative from this country has attended all the meetings.

A short-term policy (up to 1996) and medium-term policy (2001) have been drawn up taking the four zones of the Western Scheldt into account in which different functions have different priorities.

Shipping

The Western Scheldt is of great importance for shipping. Measures for the maintenance and safeguarding of this function are therefore necessary and this includes the deepening of the main navigation course.

The deepening of the Western Scheldt will mean that deeper-bottomed ships will be able to call at some harbours, that the waterway will be used more intensely and a trip to Antwerp can be made within one tide. Shipping will then be in a position to meet the requirements of tighter sailing schedules of container-scheduled services. In short, a smoother and safer organization of shipping traffic is possible if the bars in channels are lowered and a better staggering of shipping traffic can be achieved because vessels are no longer dependent on the tide.

3. Container scheduled services demand tight sailing schedules

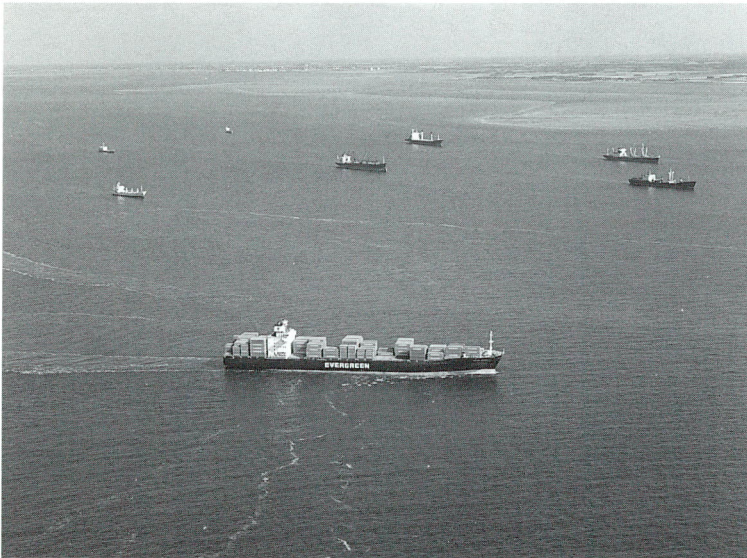
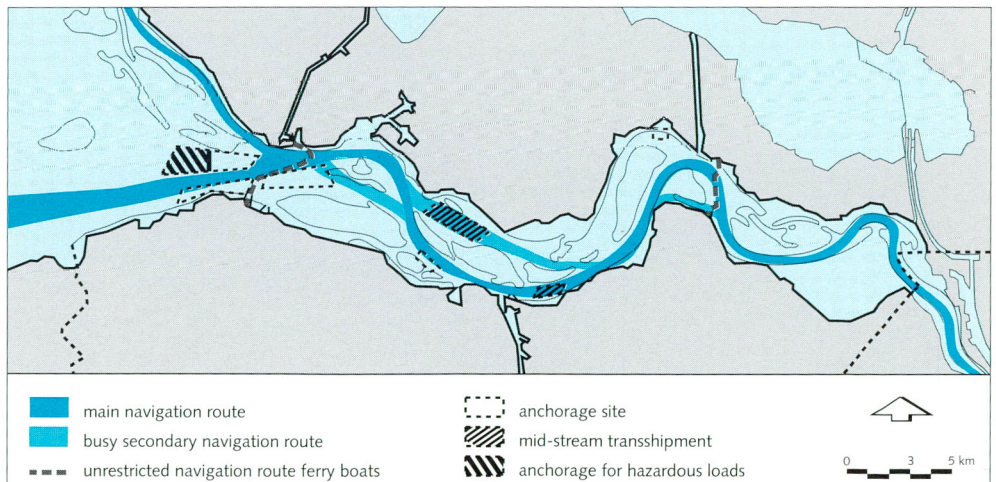


figure 2. Present navigation courses, anchorage and transshipment sites.





4. Shipping and leisure traffic sometimes come into conflict with each other.

Supervision necessary

With the exception of the direct consequences of dredging work, an increase in shipping on the waterway will hardly affect the quality of water and the environment. It is, however, important that no illegal activities such as the flushing out of tanks and the degassing of ships occur and for this reason effective supervision is a prerequisite. Naturally ships must be able to unload their chemical waste, used oil and other waste products at facilities in the vicinity of the harbours.

There is sufficient space in the Western Scheldt for a main navigation channel, busy alternative navigation routes, anchorage for ships and areas where transshipment can be carried out mid-stream.

Pleasure craft

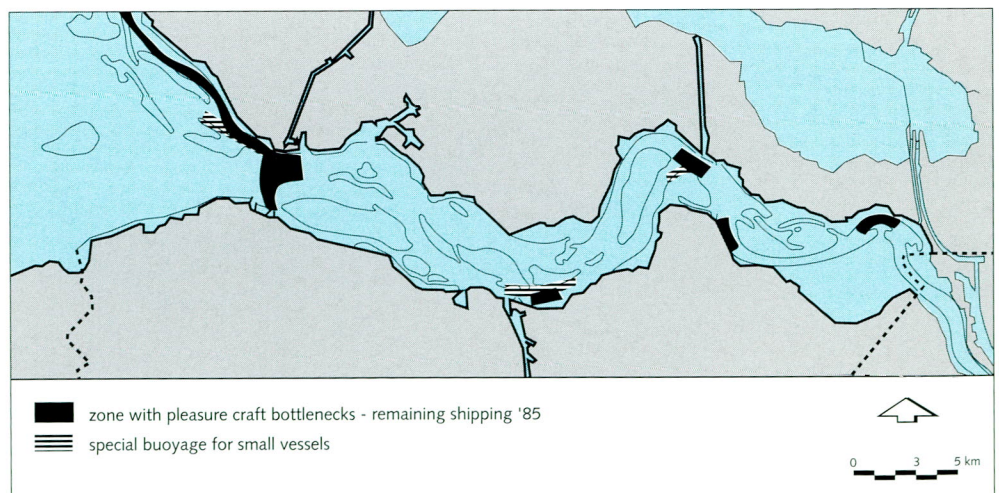
Pleasure craft also navigate this waterway. Where there is no quiet, alternative route, pleasure crafts use the main route channel. This can prove dangerous at times which is why attempts are being made to keep leisure crafts separate from professional shipping by means of alternative routes.

Safety policy

Shipping traffic is on the increase, especially cargoes of hazardous substances. The government must intervene when it comes to the safety of shipping. This safety can be advanced by improving infrastructure, legislation and regulations, supervision of law enforcement and tracing down offenders and finally through monitoring and information.

Should new regulations or legislation come into force then this should be discussed with colleagues in Belgium.

Figure 3. Recreation craft bottlenecks - remaining shipping, 1985.



Better agreements

Safety can be promoted in all manner of ways. By equipping vessels with more accurate navigation instruments but also, for example, by means of Scheldt radar units which came into operation in 1991. In addition navigation speed restrictions can be introduced at dangerous spots and the transportation of hazardous cargoes be subject to strict regulations. Pleasure craft can be given better guidance and it could become compulsory for crafts to have certain navigation instruments on board when sailing on the Western Scheldt. An investigation is being conducted to ascertain if cooperation between municipalities and other bodies can be improved in the event of disasters.

Objectives and measures

The objectives and measures mentioned aim first and foremost at making shipping as safe as possible and restraining pleasure craft on or along the main navigation channel and other busy, alternative navigation routes. Separating the two different sorts of traffic should form the foundation for this.

In addition, effective supervision and sufficient and easy-to-operate facilities

must be made available for chemical waste and used oil for example.

Harbour facilities must be modernized to accommodate the technical and economic changes in shipping.

Safety must be promoted by:

- Making it compulsory for inland shipping to carry a compass and mariphone on board.
- Conducting a study into speed restriction measures on the Terneuzen-Hansweert route and possibly Walsoorden too.
- Stringent regulations regarding the transportation of hazardous substances.
- Guidance of pleasure craft.
- Make it compulsory for larger craft to carry a compass and mariphone on board.
- Reduction in high-risk activities such as mid-stream transshipment and refueling.
- Improve arrangements and cooperation in the event of disasters.

Ecology and water management

In the Western Scheldt estuary the gradual transition zones between the various mixtures of fresh and salt water are quite remarkable. The fresh water, originating from the River Scheldt, Meuse (Maas) (via Zoommeer and Albertkanaal), the Rhine (via the Zoommeer), the River Leie (flowing into the port of Zeebrugge) and the Terneuzen-Ghent Canal, intermingle in a seaward direction with the saline water of the North Sea. In addition the morphological dynamics are peculiar to the Western Scheldt. These dynamics reveal a system of main and alternative channels, areas of deep and shallow waters, inter-tidal areas and salt marshes, dunes and both deep and shallow sea inlets (tidal gullies), sedimentation and erosion.

Both elements influence the eco-balance in the water and in the river bed. A few examples of this are the "nurseries" in shallow waters, the waterfowl function in the inter-tidal areas and salt marshes, the vegetation of these salt marshes and the ecosystems in the sea inlets. The policy aims at conserving and strengthening all these various functions and ecosystems.

5. These morphological dynamics are peculiar to Western Scheldt area



Measures will have to be taken since the Western Scheldt is over taxed with oxygen-binding substances and nutrients resulting from unpurified emissions in the drainage area.

Objectives and measures

One of the objectives in the policy plan is the conservation of these gradual transition zones with varying salt and fresh water levels in order to safeguard all the sub-species living in these zones. Phosphate compounds and nitrogen compounds will have to be reduced drastically - eventually to one quarter of their present level - in order to improve the quality of water. In the meantime, at an international level, all sorts of agreements have been made to this end including sewage purification and a reduction in discharges by imposing more stringent preconditions when issuing discharge permits.

The oxygen level in the transition zone river/estuary must reach a minimum standard (a level of 5 mg/l). The Belgian purification programme plays a major role in this, but something must be done in the Netherlands too.

Signs of eutrophication (in consequence of too many nutrients) must decrease in the coastal zone and water in the entire estuary must be fit to swim in.

Moreover, we must strive to restore

those species of fish which have disappeared from the Western Scheldt such as the shad, twaite shad, sturgeon and salmon and help them return to the river to spawn in the freshwater catchment basin of the Scheldt and restore the natural balance of river-bed life in the eastern area. Bi-valved river-bed creatures such as the smew and clams must be given a greater chance of survival and the crab and North Sea crab populations must be re-introduced into the western area.

The risk of fish diseases must be reduced and the eastern area must once again become an attractive nursery for flat fish and shrimps.

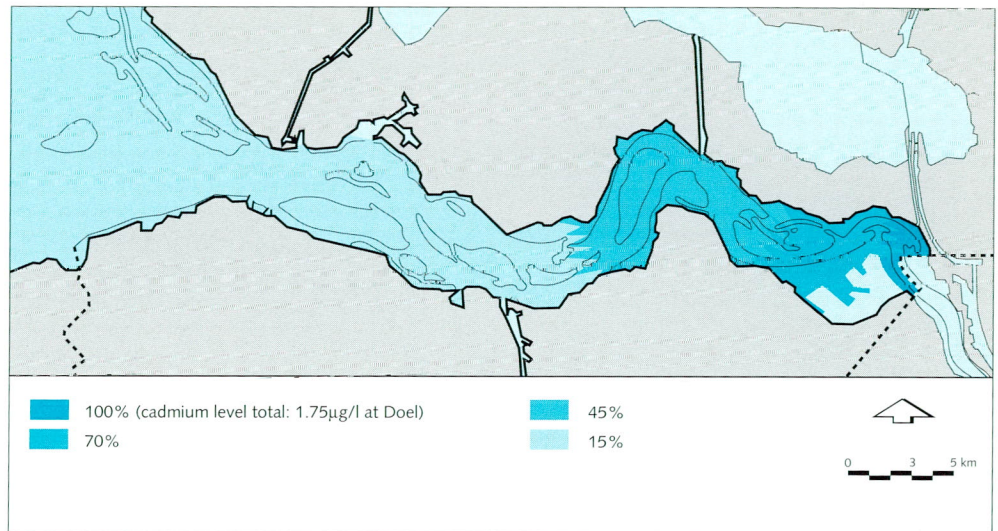
The cloudiness of the water in the eastern area of the Western Scheldt must be reduced and this can be achieved by reducing unpurified discharges and restricting dredging and dumping activities.

This will all require a number of measures such as taking the chloride content into account when flushing out the Zoommeer into the Western Scheldt. A medium-term action plan will be drawn up.

6. Sewage plants, such as here in Rithem, contribute to the improvement of water quality



Figure 4. Course of cadmium content in percentages compared with cadmium content at Doel, 1989.



Micro-pollution

The water of the Western Scheldt is polluted in a number of ways. By means of heavy metals such as cadmium, mercury and lead all elements vital to the growth of organisms in minute amounts. If they are present in high concentrations, however, they prove toxic. Organic micro-pollution such as PAHs, (polycyclic aromatic hydrocarbons), PCBs, (polychlorinated biphenyls), hardly ever or never occur in seawater. These substances can accumulate in the somatic fat of organisms and seals. At present we do not know

enough about the effects of these pollutants in estuary areas such as the Western Scheldt, but we do know that they sometimes influence the reproduction of organisms and cause diseases in fishes, birds and mammals.

Objectives and measures

A number of measures have been included in the policy plan to combat this pollution. These measures derive in part from the objectives of the Third Water-Resources Management Bill. The aim is that the water and river bed become sufficiently clean so that the fishes which have spawned here since time immemorial return and that seals will once again be seen in the Western Scheldt. Fish diseases must disappear as far as possible and sea lavender and glasswort grown in the Western Scheldt must once again be fit for human consumption. This is why the pressure caused by micro-pollution must be reduced by half compared with 1985 in the short term and by 90% in the long term.

In the eastern area, river-bed life should exist in harmony with the natural environment and in the western area a viable population of *murex purpura* must make a comeback, a creature highly sensitive to pollution. Wading birds must be able to feed on the river bed and on fish without endangering reproduction. Hence PCB levels found in river bed creatures must be reduced by 80% to 90%.

In order to combat micro-pollution a short-term action plan is being drawn up for the river-flow area of the Western Scheldt and the Terneuzen-Ghent Canal.

7. The policy plan includes the attempt to make sea lavender and glasswort fit for human consumption once again



No efforts must be spared when embarking upon the filling-in of the reduction plan in consultation with Belgium.

The action plan will in any case state that the sanitation programme covering Dutch discharges be wound up

Channel bed

The planners have also taken the channel bed into consideration. The provincial steering committee for underwater channel beds and dredging materials has studied this subject. Dredged material policy is still under highlight. The Department of Public Works (Rijkswaterstaat) has been working on a classification system for the quality of dredged materials for some years now. WVO licences are granted or withheld according to this system and this applies to the Western Scheldt too.

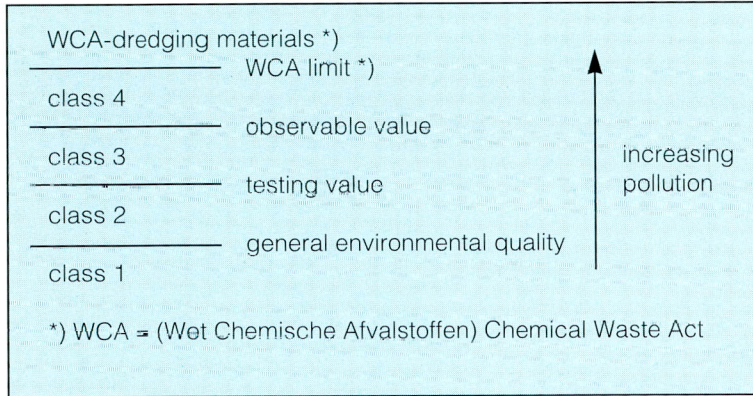
Objectives and measures

In the short term the aim is to prevent further deterioration of the quality of the channel bed in the estuary.

The dredged materials at locations where direct discharging takes place must be below the testing value. This means that dredged materials, can be dispersed conditionally. If the testing value is exceeded then distribution is not desirable. The medium-term plan aims at reaching a natural channel bed level in the estuary.

In order to achieve this, the quality of water in the Western Scheldt and the Terneuzen-Ghent Canal must improve considerably and a coherent dredging and dumping policy must be pursued.

In principle polluted dredged material may not be transferred from one water system to another in Zeeland. The foundation for this came into force 1 January 1991. This measure also stipulated that no polluted dredged material could be transferred from the eastern area to the cleaner western area of the Western Scheldt.

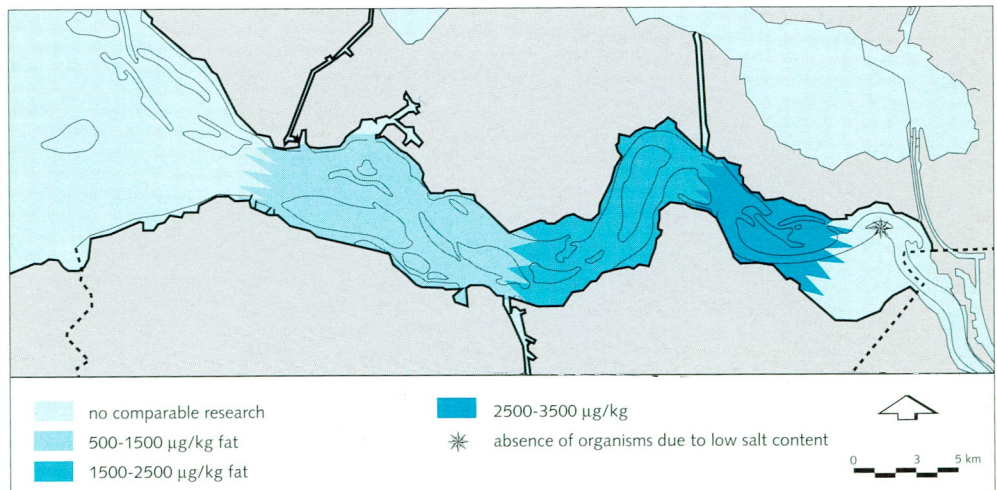


and it will also cover other substances which cause environmental pollution.

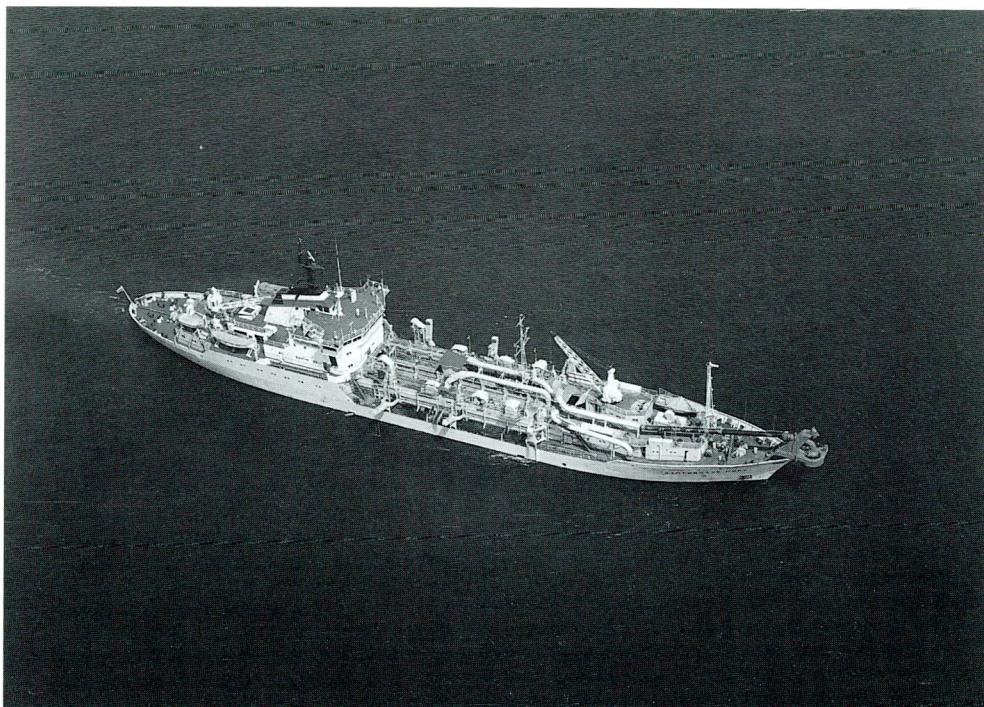
Factories must be encouraged to adopt purification programmes by pointing out the opportunities offered to them under the Pollution of Surface Waters Act (WVO Wet). Existing companies and new companies should purify their waste water by the most effective methods available and discharge applications for discharge licenses will be tested against the water system objectives of the Western Scheldt.

A medium-term action plan will be drawn up - preferably in conjunction with Belgium and industry - which will concentrate on forcing back discharges of micro-pollutants even further.

Figure 5. PCB 153 (mg/kg fat) in mud flat worm and mussel, 1987.



8. Sand
supplementation
operations using a sand
dredger



Diffuse discharges (those not discharged via a discharge system) appear mainly in polluted channel beds in the harbours along the Western Scheldt. Purification of these discharges must be continued. In the period to 1995, the policy plan aims to reduce normal maintenance dredging work by 50% of the total load pollution resulting from the dumping of dredged materials.

Restrictions

As from 1 January 1991, no dredged material originating from dredging sites which are influenced by direct discharges, of class 3 quality, may be dumped in the Western Scheldt. The dispersion of class 4 dredged material is no longer permissible. This refers to dredged materials from the harbours on the Western Scheldt and bars as the Drempeel van Zandvliet. Development of separation and purification techniques must be pursued in combination with insulated dumping for the storage of this material. Procedures laid down by the Environmental Impact Evaluation Act (Milieu Effect Rapportage) will be followed for finding a suitable site for insulated dumping.

The bars in the navigation channel can be additionally polluted as a result of calamities. Restrictions must be laid down covering the re-dumping of dredged

material in these cases. The maintenance of the waterway to Antwerp is being improved due to environmental considerations by extracting the most polluted and muddy dredged materials from the Western Scheldt originating from the Zeescheldt.

When the quality of water finally improves sanitation of the channel bed will be conducted according to the Department of Public Works programme for channel beds.

Morphological structure and dynamics

Land reclamation, dredging and dumping activities have all taken a toll on the estuary. They have restricted the natural channel dynamics, they have influenced the bird and nursery function by reducing the space available and they have reduced the value of inter-tidal and shallow water areas. A number of objectives focus on a policy which meets not only the interests of shipping but also those of ecology, nature and fishing.

Objectives and measures

It is important that now and in the future the waterway be preserved at the agreed depth and that thereby the natural morphological dynamics of the region are disturbed as little as possible.

It is therefore necessary to restrict maintenance dredging work to a minimum and this in turn reduces the risk of spreading pollution. The aim is to preserve as many of the existing shallows, inter-tidal areas and salt marshes as possible and to prevent the erosion of banks, mud flats and salt marsh perimeters due to the dumping of dredged materials and rubble filling.

Of course the water-control structures must be kept in good working order.

Recovery

It is the intention that in the long-term a number of characteristics peculiar to an estuary such as the Western Scheldt are conserved or recovered. These are:

- salt marshes, inter-tidal and shallow water areas with the accompanying ecosystems;
- a natural tempo for drying up of the salt marshes (accelerated sludge build up/silting up of Het Land van Saeftinge and the silting up of the Zwin must be prevented);
- a dynamic and multiple channel system.

A number of measures can assist in this such as the optimum utilization of dredged materials and the most effective combination of maintenance work and sand dredging.

Recreation

The Western Scheldt is a highly popular recreational area especially the beaches in the estuary area, while the rest of the area is popular with watersportsmen. The policy plan aims to maintain the present level of recreation within the area. There is even room for a limited expansion of recreational activities.

An attempt is being made to extend the existing separation of "fast" and "slow" shipping. There is room for this on the coastal side of the navigation channel through the Oostgat and on the northern side of the navigation channel east of Terneuzen.

Up to now watersportsmen have had access to the shallows although continual monitoring is necessary to make sure this has no detrimental consequences. Only the Hooge Platen complex is not open to the public.

Figure 6. dredging site.

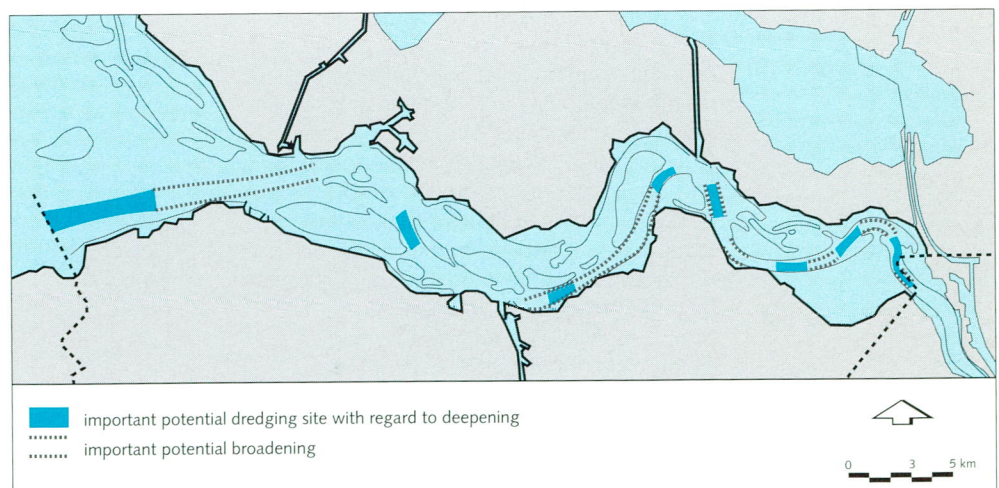
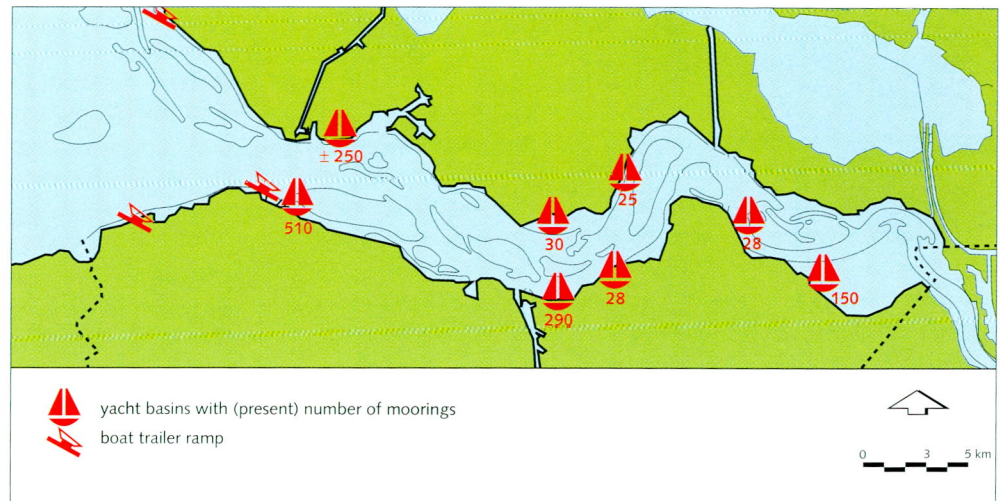


Figure 7. Present yacht basins and boat trailer ramps.



In comparison with other Delta waters, windsurfers take little advantage of the Western Scheldt and anglers are not often seen on the water.

Naturally good water quality is important for swimmers and watersportsmen and women. This is not always the case in some parts of the Western Scheldt and the policy plan aims to improve the quality of water in these areas.

Special attention must be given to the nature area the Zwin and additional organizational and management measures must be adopted in order to steer recreation in the right direction.

Objectives and measures

Recreation can be expanded in some areas, but care must be taken not to damage any of the area's natural assets.

There is no room available for the building of new yacht basins after the recent construction of the Michael de Ruyterhaven in Vlissingen and developments already authorized in Breskens. Expansion is only possible at a local level on condition that it is restricted in size and poses no insurmountable conflicts with other functions. There is room for 50 to 100 additional moorings in Hoedekenskerke.

Where possible and necessary the separation of "fast" and "slow" vessels will be extended and restrictions made on the number of crossings with main navigation routes.

If possible, in relation to the width of the navigation water, the shifting of the buoying at Hooge Platen and the extension

of the existing entry arrangement are necessary in order to keep the level of disturbance to a minimum at the Hooge Platen complex.

Possible disruptions of other free shallows must be examined on a regular basis.

The plan aims to preserve and where possible expand beaches where desirable in relation to coastal management as well as from a tourist-recreation viewpoint.

The expansion of a number of trailer ramps is only possible if this does not conflict with other functions.

New facilities close to the main navigation channel or close to vulnerable wildlife areas must be avoided.

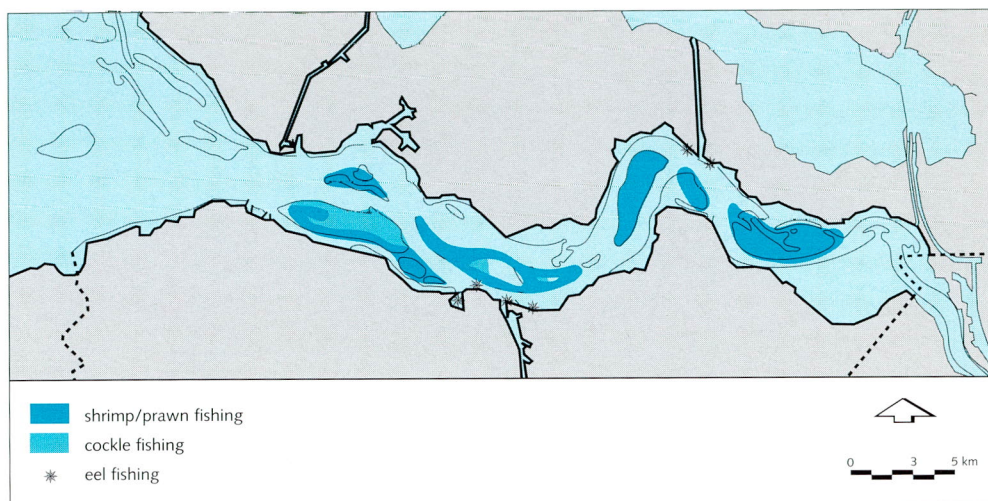
Fishing

Coastal fishing is conducted in the Western Scheldt (shrimps in particular) but cockles, sprats, eels and grey mullet are also fished. Vlissingen and Breskens serve as fishing ports for offshore fishing. The Western Scheldt is also important for fishing as a nursery and growing area for young sole and shrimps.

The fishing industry is not flourishing in the Western Scheldt and this can be attributed to the poor quality of the water causing reduced catches. Fish catches also display a relatively high number of diseases.

The policy plan contains a number of objectives and measures aimed at improving the situation within the fishing industry.

Figure 8. Fishing area
(present use).



Objectives and measures

The most important objective is the restoration of favourable qualitative and quantitative conditions for the catching of fish and in consequence the improvement of coastal fishing as a branch of industry. In order to achieve this the nursery function of the area must be guaranteed and sites and methods of dumping dredged material must be chosen which have the least negative effect on fish stocks. Now that the Hooge Platen complex has been ascribed the important function of nature reserve those activities which upset the ecological balance such as cockle fishing and fishing for grey mullet must be reduced.

9. Fishing catches are low in the Western Scheldt due, in the main, to poor water quality



Water-control structures

A total of 182 kilometers dunes and dikes border the Western Scheldt east of the Westkapelle-Zwin line. The flood-control structures all operate at Delta strength and can withstand storm tides which occur once every 4000 years.

The beach and dune protection policy, just like the policy for the entire Dutch coast, states that the 1990 coast line must be maintained. This can be achieved by sand supplementation. The river banks must be preserved and this frequently involves elaborate and costly measures.

Shore protection with submerged beaching form a sort of artificial rocky shoreline and this affords protection for underwater flora and fauna. Good water quality is also important for the survival of these delicately-balanced, river ecosystems. Because a re-rising of the Delta dikes must be taken into future consideration - in connection with the anticipated land subsidence and rise in sea level - extra space has been reserved for this, both on the land side and the sea side. It is important for water-control structure that building on or near sea-defence structures is prohibited. Only weighty arguments will prove an exception to the rule.

Objectives and measures

The policy plan also states a number of objectives and measures concerning water-control structures.

In regard to the joint interests of water-control structures, recreation and



10. Sand supplementation is necessary to maintain the beaches and preserve the coastline as it was in 1990

nature, the erosion of the sand coasts in the estuary area must be checked by means of sand supplementation.

The deepening erosion along the salt marshes must be prevented by constructing shore protection and beaching.

Shore protection materials must be suitable for the preservation of flora and fauna in the inter-tidal zones.

Remaining functions

The Western Scheldt fulfills many other functions not mentioned here. Hunting takes place in the vicinity of the Western Scheldt and many cables and pipelines lay in the estuary bed. The area is also used for the generation of wind energy. Mineral extraction also takes place. Sand is extracted from the river and in the past oil and gas have been drilled for. One license holder extracts shells from the Western Scheldt. The policy plan also takes aviation into consideration because noise pollution and silhouetting can have an adverse effect on bird populations and seals.

Aims and objectives

Aims and objectives have also been drawn up covering these remaining functions.

Hunting in the brooks must remain restricted to supervised hunting in order to realize nature objectives and in order to prevent game damage to crops and water-control structures.

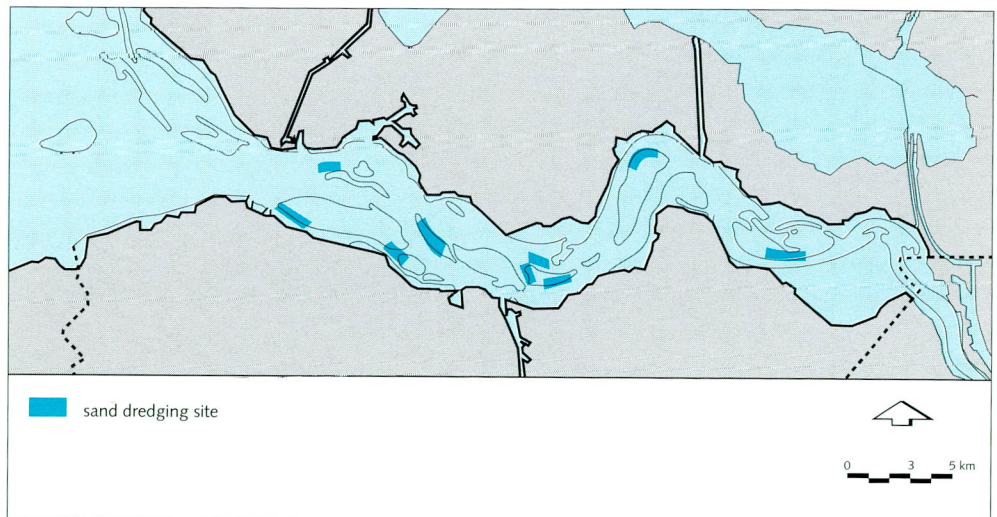
The direct and indirect use of space for piping must be kept to a minimum by bundling new piping within the existing infrastructure.

When laying, using and controlling cables and piping, harmful effects on the environment, landscape etc. must be prevented.

In principle the erection of wind turbines in the water and on tide-land or inter-tidal areas is forbidden.

The important bird function in the area must be taken into consideration when siting windmills as well as the importance

Figure 9. Present sand dredging areas for licence holders.



of water-control structures and the possible hampering of shipping and for radar and other orientation installations.

The policy on commercial sand extraction in the Western Scheldt must not upset the morphological equilibrium in the sand balance and in principle must be carried out below the Normal Amsterdam Level (N.A.P) minus 5.00 m.

In the short term the amount of sand to be extracted from the Western Scheldt should be stabilized at a maximum level of 2.6 million cubic meters per annum.

Because of the scarcity of suitable sand in the coastal area, sand stocks here must be reserved for coastal supplementation.



11. Important bird functions must be taken into consideration when constructing windmills in the area

When allocating shell extraction areas, disturbance-free zones such as bird nesting colonies and resting places for seals must be taken into consideration.

If drilling licenses and concessions are granted then the aims and objectives of this policy plan must be taken into consideration

Action plan up to 1996

Now that all the plans, objectives and intended measures are on paper the question remains who is to do what? After all, many different bodies are involved.

The action plan clearly states who is responsible for what. The Province of Zeeland for example has included all the relevant environmental planning in the policy plan in its own regional planning. But not just the Province of Zeeland, numerous ministries, municipalities and water authorities are involved in the Western Scheldt. And Belgium and other Dutch government agencies will have to cooperate too.

The action plan also indicates when specific measures must be taken, within which framework and who is responsible for their financing.

Actions

Broadly speaking, the actions can be sub-divided into activities to be put into practice, monitoring of the desired policy, in actions for setting up consultations and in conducting underpinning studies.

The policy plan gives an overview of the activities to be undertaken. Roughly speaking, short-term activities (up to 1996) can be classified under the following headings: shipping and sea port activities, oxygen and nutrient management, micro-pollution, river bed and morphological structure and dynamics. And further activities covering recreation, fishing and water-control structures. Medium-term actions include programmed oxygen and nutrient management, micro-pollution, river bed and morphological structure and dynamics.



Fantasy or reality?

A sailing trip on the Western Scheldt in 2015

We reach the river estuary on a strong outgoing tide. The proximity of the sea is noticeable by the increasing number of terns circling the boat. Sandwich terns and smaller terns forage for fish in the shelter of the shores and shallows. And in the distance the vague outlines of tankers on the roadstead of Vlissingen. We slip into the Schaar van Spijkerplaat. Here we pass a couple of small cutters from Breskens fishing for shrimps, shad and twaite. On the northern side of the Hooge Springer lie quite a number of dark torpedoes, most are fat and dull but some remarkably small and slender. Seals of course; and the binoculars confirm this. As we approach they become a little agitated. Let's not push our luck, at a distance of eighty meters we change our tack. The older animals are clearly darker whilst the youngsters have

attractive light skins, even on their undersides, mottled on their backs. To port, extensive shallows and tide-land transected by deep channels, dried up mud flats, teeming with all sorts of migrants. Flocks of birds in large numbers. These annual globe trotters are here for a "refuel" on their way from the pole to the equator and back again. The vast space of this tidal landscape is overwhelming. Far on the horizon we can just make out a row of trees in Zeeland Flanders. We descry the green haze of low dunes and clouds of birds above. The fluttering and screeching from the nesting colonies of gulls and terns and in the background the high-tech landscape of Sloe form a remarkable combination. The industriousness of man and nature - hand in hand - characteristic of the Western Scheldt, now we know exactly where we are!



Research

It goes without saying we must keep a finger on the pulse. The Province of Zeeland and a number of ministries will therefore conduct continual research into sources and effects of pollution, the technical aspects which come into play and into the morphological processes in the estuary. Research is already being conducted into the treatment of dredged materials in combination with sand extraction and into the risks accompanying the transportation of hazardous substances by water.

Should you require more information having read this brochure please apply to one of the following Departments of Information:

Province of Zeeland
Sint Pieterstraat 42
4311 EW Middelburg
The Netherlands
Phone 31 (0)1180-31400
or
Department of Public Works Zeeland
(Rijkswaterstaat)
P.O.Box 5014
4300 KA Middelburg
The Netherlands
Phone 31-(0)1180-86000

Terminology

boat trailer ramp

a ramp whereby (pleasure) craft can be launched into the water from a trailer

buoying

the systems of buoys for marking shipping channels

chloride content

measure for the saline content of water (expressed in weight of chlorine ions per water volume)

diffuse discharging

discharges not passed through a discharge pipe but spread on the surface water (e.g. via precipitation and ship maintenance in harbours)

ecology

the study of the interrelations between living organisms and their environment

E.I.E.A. (M.E.R.)

Environmental Impact Evaluation Act

erosion

the removal of land surface under the influence of running water, wind and ice formation

estuary

a wide funnel-shaped inlet of the sea at the mouth of a river with gradual transition from salt to fresh water

eutrophication

expansion of the food resources in surface water by increase in phosphates and nitrates

fauna

a collective term denoting the animals occurring in a particular region

inter-tidal region

outer-dike area which is flooded daily by the tide

morphology

the study of the structure and forms of organisms, as opposed to the study of their functions

Normal Amsterdam Level (N.A.P.)

water level used to calculate the water level for the whole country

nutrients

anorganic food substances for plants (namely phosphates and nitrates)

PAHs

polycyclic aromatic hydrocarbons

PCBs

polychlorinated biphenyls

salt marsh

outer-dike region with salt-loving vegetation which is only flooded by salt or brackish water at high tide
sea inlet (tidal gully): an area where seawater via a gully forces its way through the dunes

sand supplementation

supplementation of sand to shores and coasts which have deteriorated too far owing to erosion

Colophon

This brochure is an English translation of a summary of the policy document "Beleidsplan Westerschelde", as determined by the Bestuurlijk Overleg Westerschelde in March 1991

Text

Ineke Vervorst
John Beijersbergen (Fantasy or reality?)

Translation

Sarah-Jane Jaeggi-Woodhouse, Vertaalbureau Spruit

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Pitman B.V., Goes

Lay out

Bram de Buck, Rijkswaterstaat, Zeeland

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Photography

photograph	1, 2, pag. 3	AEROVIEW - Dick Sellenraad
photograph	5, 7, 9, pag. 21. 22	Wim Riemens
photograph	4, 6	Jaap Wolterbeek
photograph	3, 8, 10	Grafische Technieken MD Rijkswaterstaat
photograph	11	Jan van den Broeke DGW

