

Institutional aspects of monitoring

Maarten Hofstra

Rijkswaterstaat

Unesco-IHE

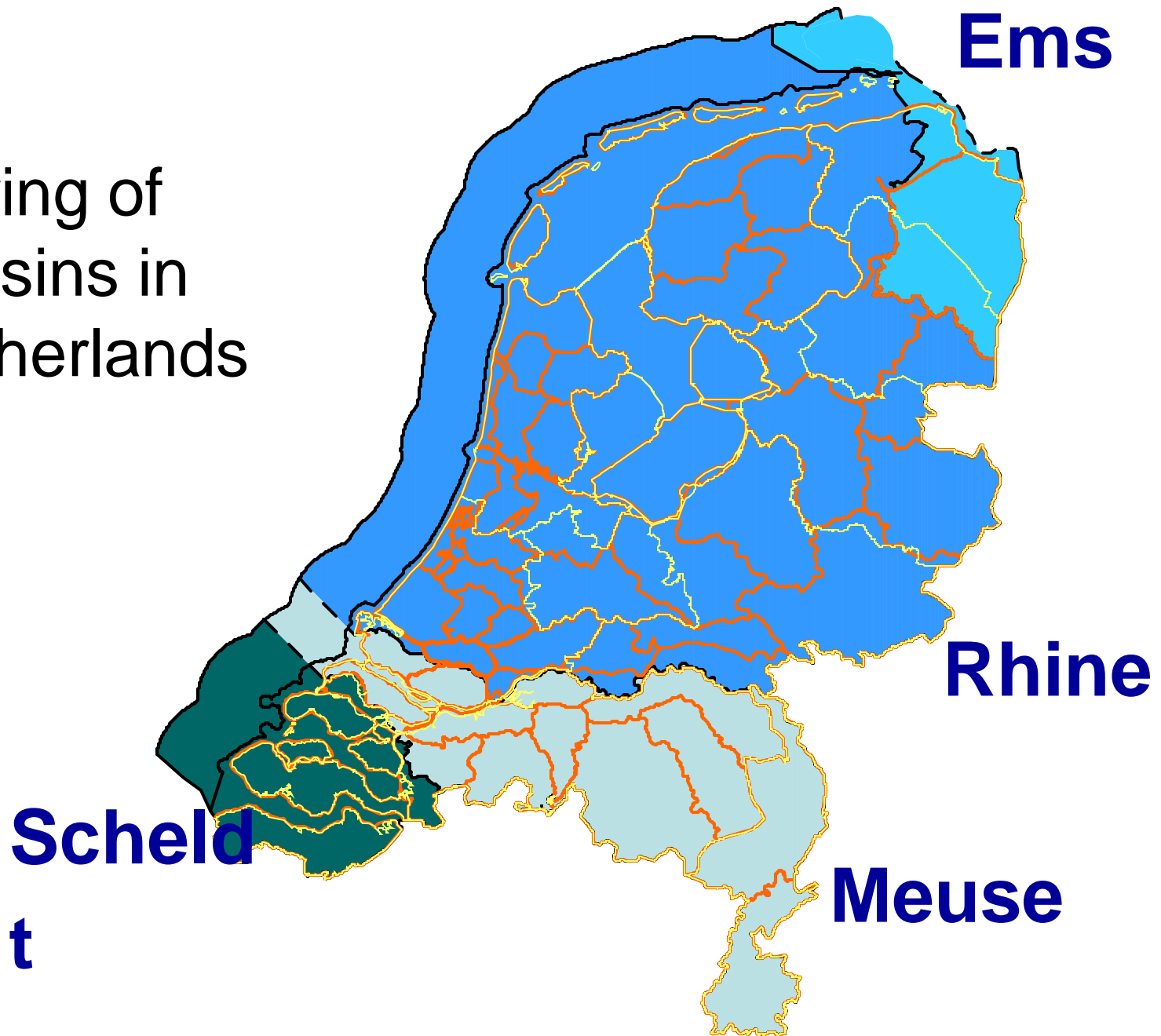
Water Governance Centre NL

The public and scientists

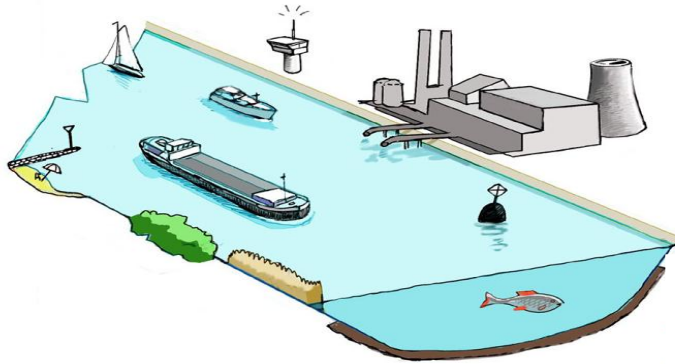


Well? Speak up man! Is it safe?

Monitoring of
river basins in
the Netherlands



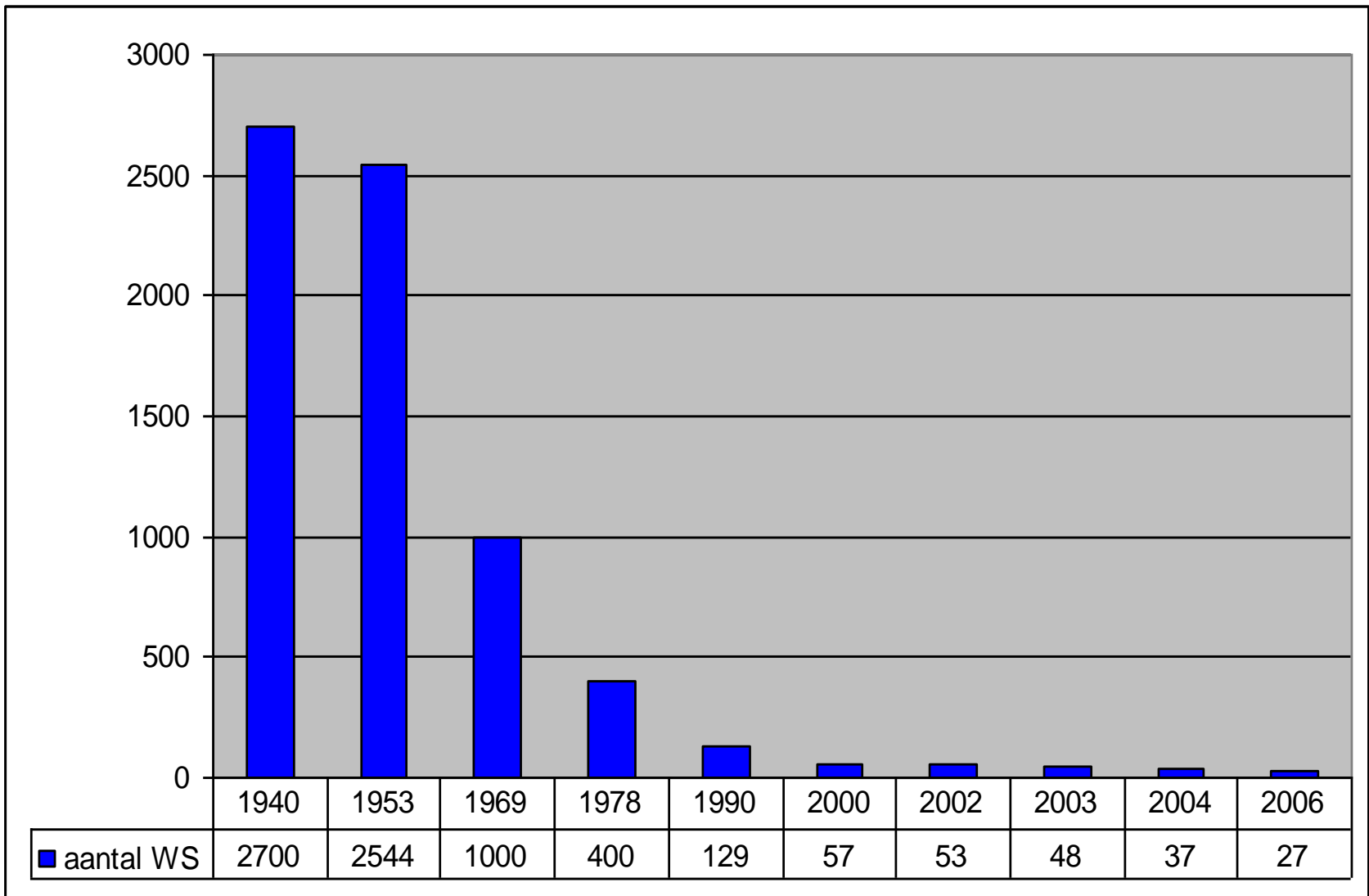
Water management



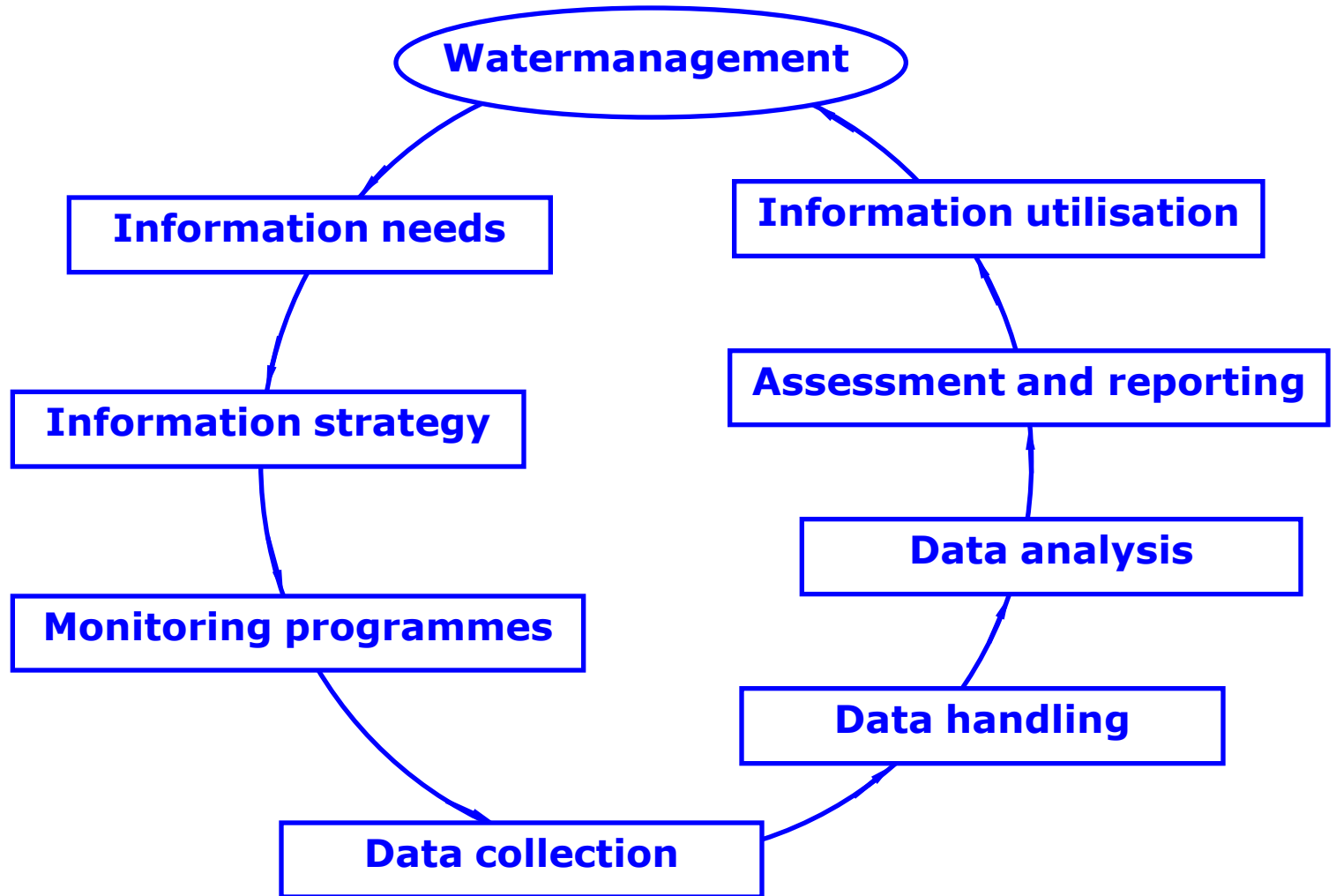
Main rivers, big
canals, large lakes
and the sea
managed by de
(deconcentrated)
State organization



Waterschappen (25)



Monitoring cycle



Helpdesk Water

- Homepage
- Actueel
- Onderwerpen
- Organisatie

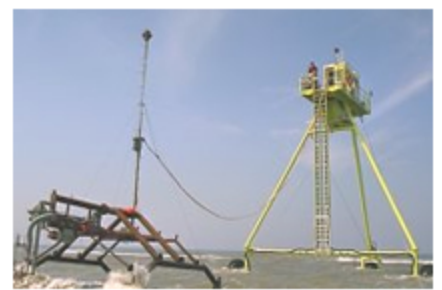
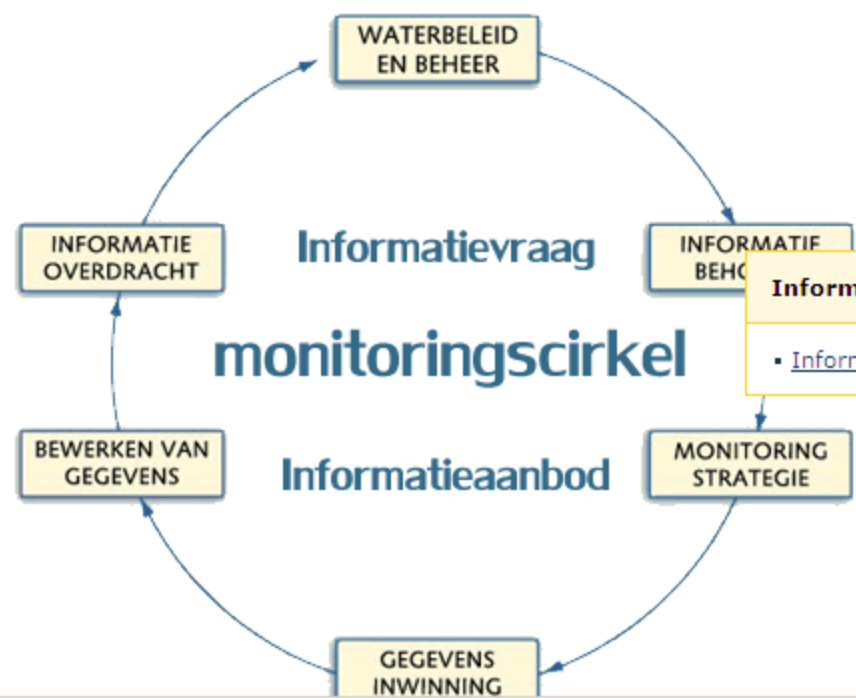
 zoek
 Sitemap Zoeken in deze site

- > Applicaties en modellen
- > Emissiebeheer
- > Gebruiksfuncties water
- > Kust en zee
- ▼ Monitoring
 - ▼ Leidraad monitoring
 - ▼ **Monitoringscyclus**
 - > Waterbeleid en waterbeheer
 - > Informatiebehoefte
 - > Meetstrategie en meetnetontwerp
 - > Monstername, analyse en opslag
 - > Gegevensanalyse en -verwerking
 - > Rapportage en overdracht
 - > Thema's
 - > Bibliotheek
 - > Gegevensinwinning
 - > Hydromorfologie
 - > Ecologie
 - > Ringonderzoeken laboratoria
 - > Landelijk Meetnet Water
 - > Normen voor het waterbeheer

[Homepage](#) > [Onderwerpen](#) > [Monitoring](#) > [Leidraad monitoring](#) > [Monitoringscyclus](#)

Monitoringscyclus

Door op de procesvakken in onderstaand figuur te klikken komt u gelijk bij de juiste informatie.



stel ons een vraag

- Documenten**
- Informatiebehoefte**
 - [Informatiebehoefte](#)
 - Eindrapport Leidraad Monitoring Gewasbeschermingsmiddelen [Pdf-bestand] (1 mb)
 - Handboek voor de provinciale en landelijke meetnetten bodem- en grondkwaliteit [Pdf-bestand] (4 mb)

Developing monitoring networks

- Physics network – since \pm 1800
- Chemical monitoring network – since 1952
- Automated water quality monitoring network - early warning – since 1978
- Biological monitoring network – since 1992

During the years: Many evaluations and redesigns



Water quality monitoring: optimisation studies

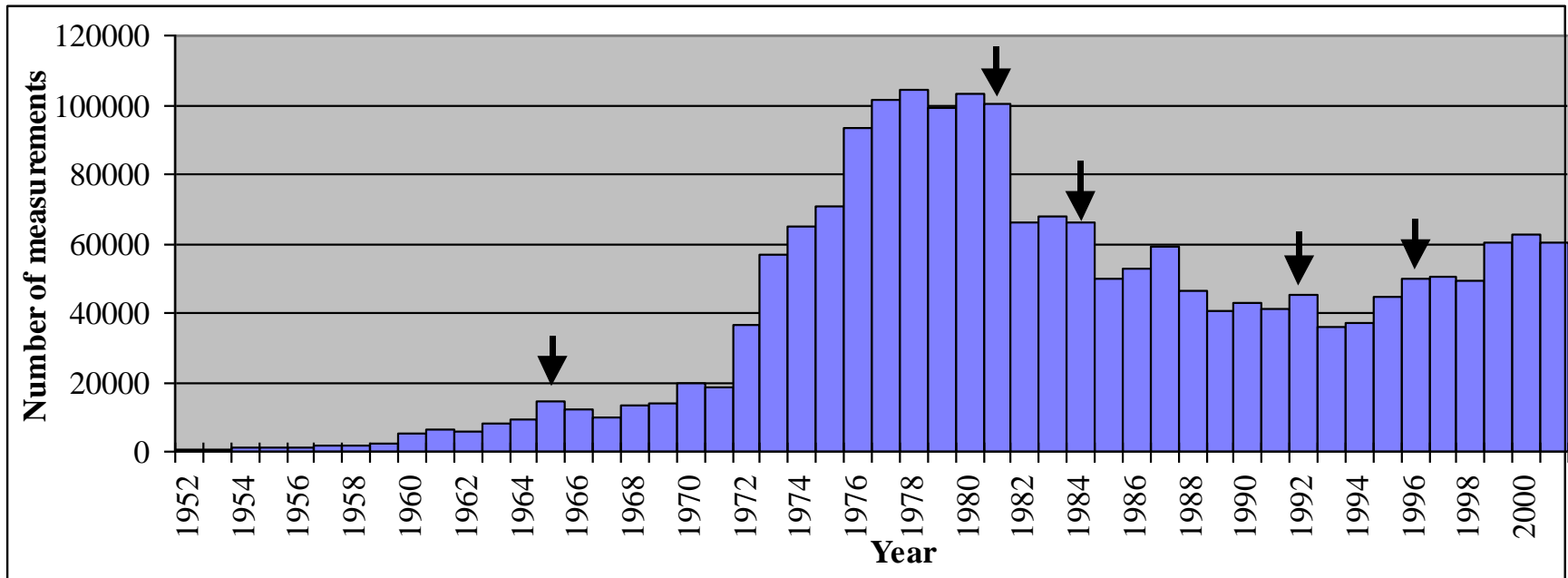
Year	Description
1965	Statistical analysis: <ul style="list-style-type: none">• Subsequent monitoring locations in rivers highly correlated• A sampling frequency set to once per two weeks
1978 - 1981	Statistical analysis: <ul style="list-style-type: none">• A monitoring network with few locations and a high sampling frequency would yield more information than a network with much locations and a low frequency
1984	Attuning to new water quality plans, changed legislation and a new water management policy document
1991 - 1992	Information needs and statistical analysis <ul style="list-style-type: none">• Low sampling frequencies not suitable for detection of significant trends• Large reduction in monitoring locations and a radical change in choice of parameters
1996	The study has led to some changes in the choice of parameters.

Monitoring locations in the Netherlands

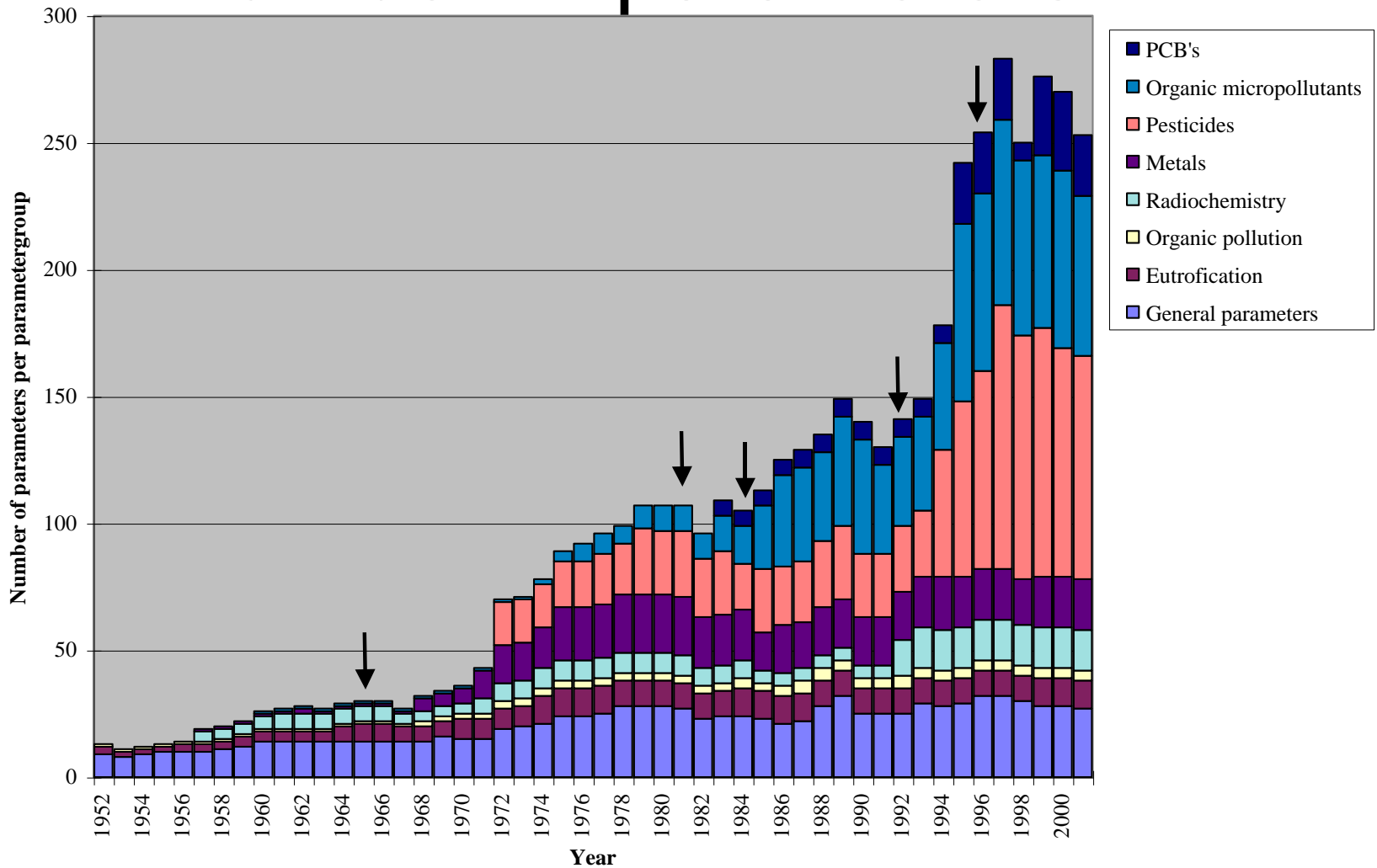
National Water Quality Monitoring network

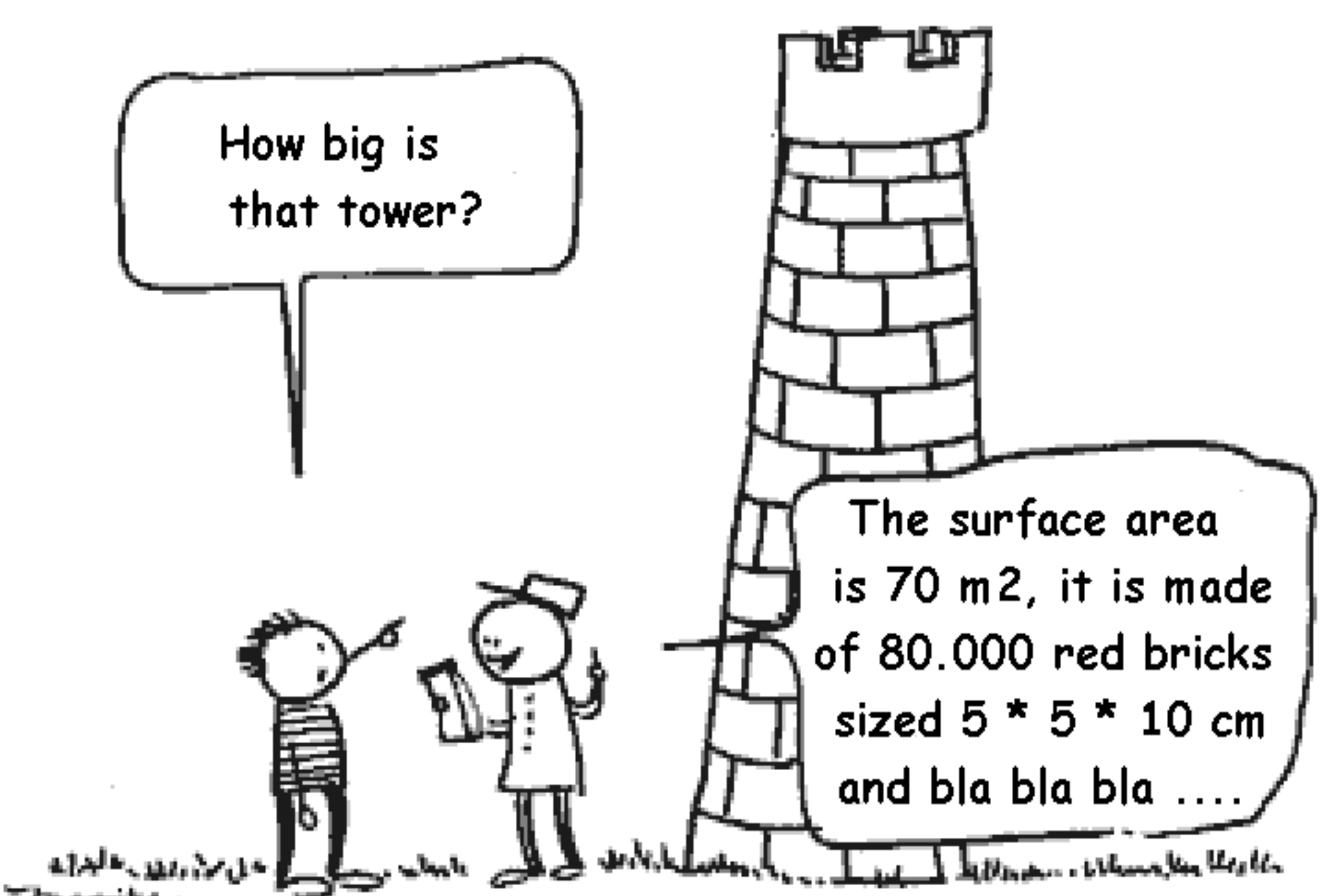


Number of measurements



Number of parameters



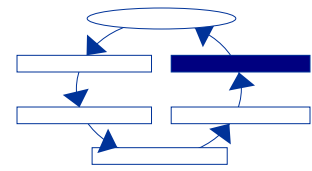


How big is that tower?

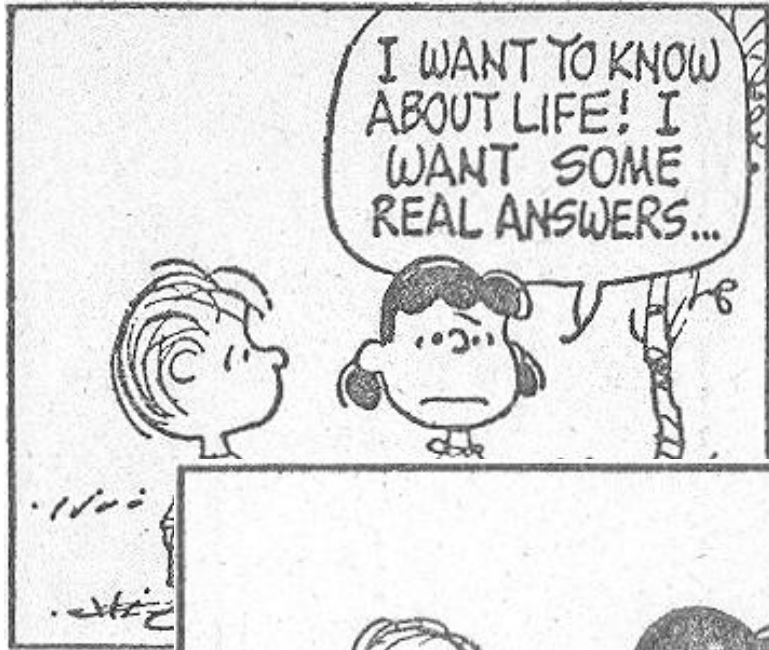
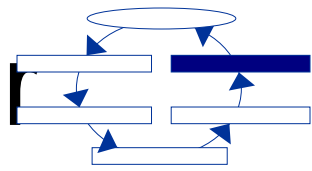
The surface area is 70 m^2 , it is made of 80.000 red bricks sized $5 * 5 * 10 \text{ cm}$ and bla bla bla

What kind of information do you really want?

The specialist



Index or indicator



Incentives

- Nothing goes without an incentive



Products

- Obligations by law
 - Report to the national parliament
 - Policy making and evaluation
- International obligations and cooperation's
 - Rapports for river committees, OSPAR, EU (WFD)
- national appointments:
 - RIWA (drinking water) rapports Meuse en Rhine
- Water system rapports (integral view of the state and trends of water systems)
- Rapports from projects: search and signaling new substances

e.g. Pollution of the Meuse by Glyfosate (a herbicide)

Annual reporting to parliament

Annual report
on water management
in the
Netherlands

Water in Focus 2003

CIW

1740 EN EEN
STOND HET WATER
AAN DESEN STEEN.

1819 EN EEN
STOND HET WATER
AAN DESEN STEEN

1809 IS HET WATER
AAN DESEN STEEN
GESTEEN.



Other chemical substances, the concentrations of which greatly exceed the target values, include polychlorinated biphenyls (PCBs) and pesticides, the most important of which is triphenyltin (TPT). In some saltwaters, TPT concentrations were 100 times higher than the maximum permissible risk level. Frequently used in potato growing, TPT is not easily degradable. The concentrations of tributyltin (TBT), a chemical substance used in anti-fouling paint on ships longer than 25 metres, exceed the maximum permissible risk levels by more than 300 times. To solve this problem, the *International Maritime Organisation* (IMO) reached an agreement regarding a ban on the use of TPT on ships starting in 2003. The concentrations of the pesticides diuron, simazine and metolachlor exceed the target values in the coastal waters and the saltwater delta. In recent years, the concentrations of most of the chemical substances have not decreased at all or only slightly. Accordingly, the target values are not expected to be met by 2015.

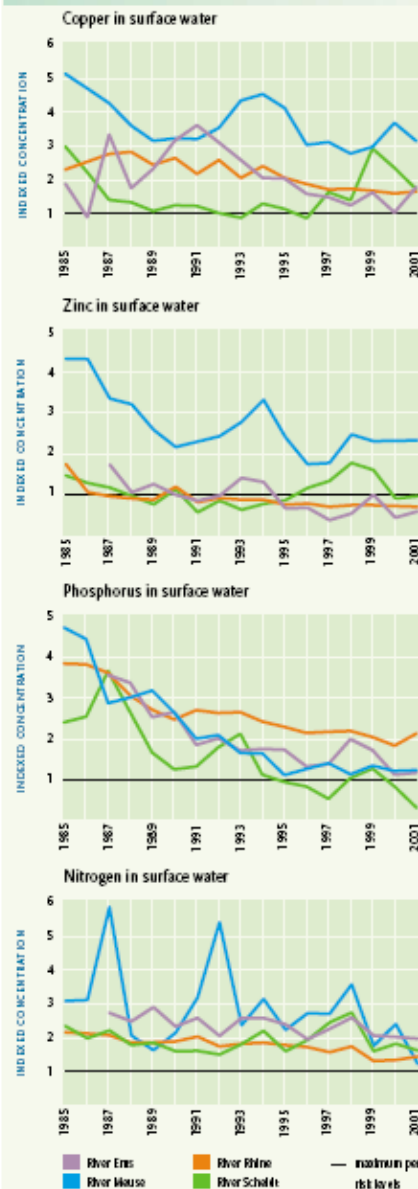
Water quality trends in the catchment areas
The figures present the concentrations, expressed as a factor indicating the extent to which the standard (indexed concentration) is exceeded. This clearly shows the degree to which the recorded concentrations exceed or fall below the standard. The information is presented according to international catchment area as outlined in the *Water Framework Directive* and indicates, according to catchment area, the averages of data collected in regional and national waters.

In general, copper, zinc, phosphorus and nitrogen concentrations reveal a stagnating trend with regard to water quality improvements. During the last decade, phosphorus loads reaching surface waters have decreased by 58%, while nitrogen loads have only fallen by 16%. Closer investigation of the sources of these nutrients within the Netherlands revealed that agriculture is a primary source of nutrients from fertilisers (total nitrogen concentrations and total phosphorus concentrations), metals that leach from agricultural areas (copper and zinc) and pesticides. In addition to sources in the Dutch water systems, each year the River Rhine, River Meuse and River Scheldt transports substantial amounts of nutrients from abroad. These have not been significantly reduced in the last fifteen years.

Pesticides
For the first time in years, a slight improvement in water quality has been noted with regard to pesticides. The percentage of sites monitored that exceed the short-term target – maximum permissible risk levels – for one or more pesticides has fallen slightly, despite the fact that a larger number of locations were monitored.

This improvement has been attributed to the effects of the pesticides authorisation policy, which forbids or substantially restricts the use of the majority of environmentally harmful pesticides. Withdrawal of these pesticides from the market however, has created problems for a variety of crops. The Dutch government has addressed this by giving form to and implementing the motion submitted by members of parliament Feenstra and

2.3 Water quality trends – nutrients and metals



Source: CMA survey and Directorate-General for Public Works and Water Management, 2002



Financial and economic consequences

Strategic objective

To gain insight into the financial and economic consequences of water management in order to facilitate effective decision-making to meet the targets of integrated water policy.

6.1 Costs and revenues of the Directorate-General for Public Works and Water Management, water boards, municipal authorities and individuals

Cost trends of the Directorate-General for Public Works and Water Management

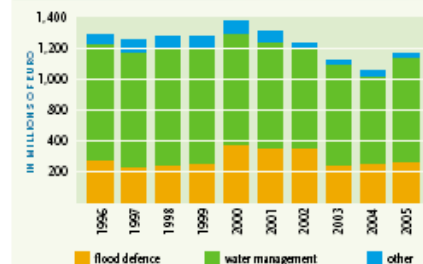
The expenditures of the Directorate-General for Public Works and Water Management total approximately EUR 1 billion a year. The money is used for the preparation and implementation of policy, as well as the management and maintenance of the main water system, waterways, harbours and flood defence structures. In 2003, expenditures for water management will fall substantially – more sharply than in the previous two years – largely due to the completion of the *Delta Plan for the Major Rivers* project. As from 2006, expenditures will increase due to the implementation of projects – up to the year 2020 – that have been agreed upon within the framework of the *Water Policy for the 21st Century* project. The budgets for flood defence and flood protection will structurally increase by 2.8% above standard inflation correction. The *Fourth National Policy Document on Water Management* had already announced the downward trend in Directorate-General for Public Works and Water Management expenditures, although the decrease is larger than predicted. This trend is expected to continue up to 2004. All of the amounts presented in the table are expressed in constant prices, based on 2002 price levels. Of the expenditures for actual implementation, 25% goes towards the flood defence infrastructure and 75% towards management of the water infrastructure. The expenditures of the Directorate-General for Public Works and Water Management are financed using funds raised through general income tax (i.e. financed by individual taxpayers).

Cost and revenue trends of the water boards

Of a water board's revenues, 97% is generated through charges imposed on households and companies within the water board's management area. Each household pays approximately EUR 200 a year to cover the costs the water board incurs for fulfilling its role, i.e. flood defence and water, land and waterway management. These involve total apportioned payments, including the revenues from charges imposed on companies. In reality, these charges are paid by households, as the costs are incorporated into product prices.

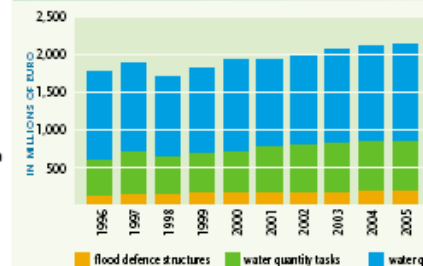
The charges comprise apportionment charges (quantity management) and pollution levies (quality management). Of the charges, two-thirds involve quality management costs,

6.1 Cost trends of the Ministry of Transport, Public Works and Water Management according to task (2002 price levels)



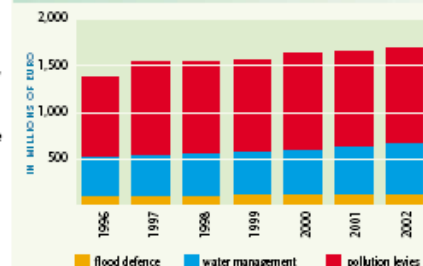
Source: 2003 Ministry of Transport, Public Works and Water Management budget

6.2 Cost trends of water boards according to task (2002 price levels)



Source: Association of Water Boards

6.3 Revenue trends of water boards (2002 price levels)

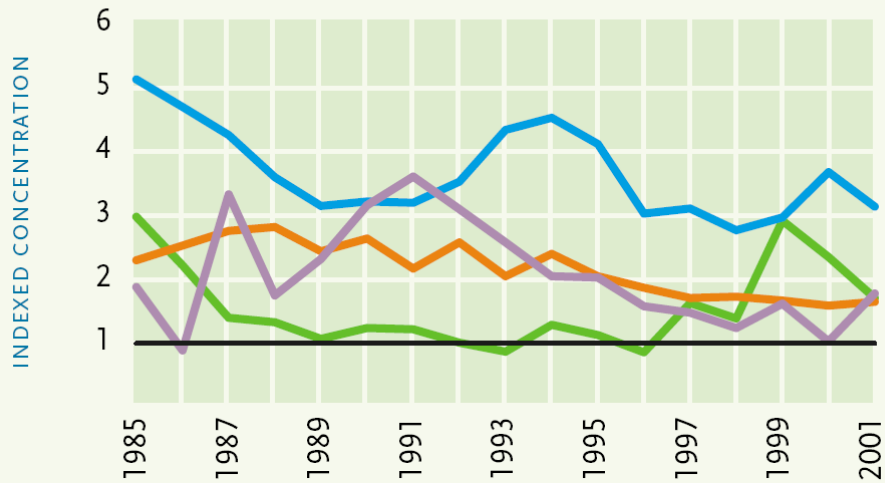


Source: Statistics Netherlands

Water in data

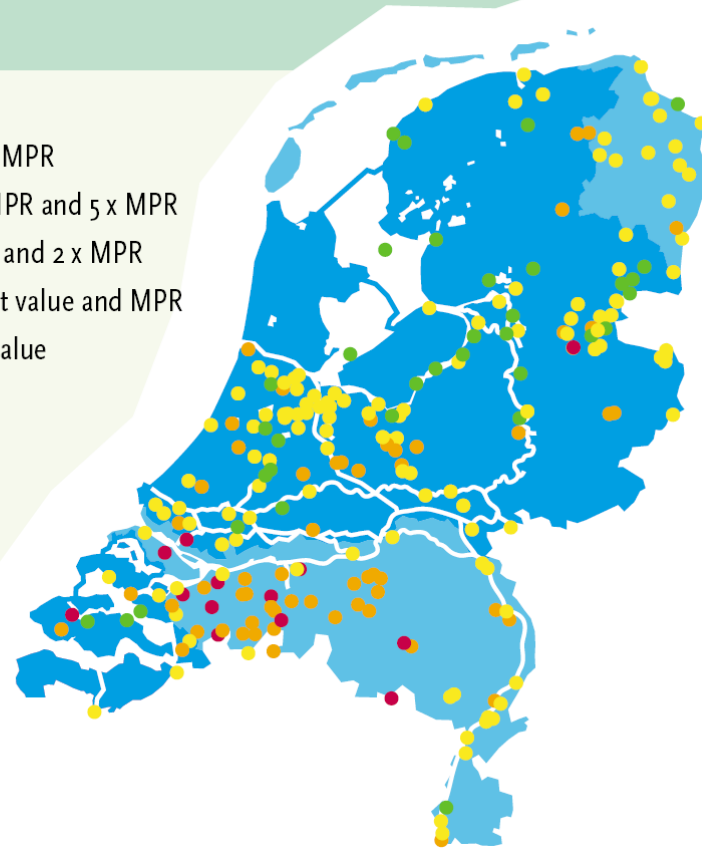
2.1.4

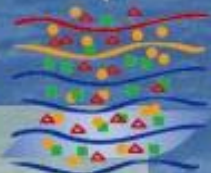
Copper in surface water



- River Ems
- River Meuse
- River Rhine
- River Scheldt
- MPR = maximum permissible risk levels

- more than 5 x MPR
- between 2 x MPR and 5 x MPR
- between MPR and 2 x MPR
- between target value and MPR
- below target value





Activiteit van cobalt 60 in Bq/kg drooggewicht in zwevende stof

▶ [HOMEPAGE](#)

-
-
-
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-
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Topografische achtergrond (c)2000 Topografische Dienst Nederland

Locaties

GA VERDER

The role of the Water Framework Directive (WFD)

- The WFD is meant to improve the ecological quality of water bodies in the European river basins

But

- The WFD works as well as a strong incentive to optimise monitoring and information process

A Water Framework Directive Portal

To download the necessary information to make the River
Basin Management Plans

PORTAAL
Kaderrichtlijn Water

A website partly open for everyone to get the necessary information on:

- Water bodies
- Swimming water
- Natura 2000 areas
- Etc.

Combining forces and uniting information



The screenshot shows a web browser window displaying the homepage of Informatiehuis Water. The browser's address bar shows the URL <http://www.informatiehuishuiswater.nl/>. The page features a header with the title "Informatiehuis Water" and a subtitle "Een samenwerkingsverband van IPO, Rijkswaterstaat en Het Waterschapshuis". Below the header is a navigation menu with links for "Proclaimer", "Abonneren", and "Waterrapportagedag 2011". A search bar is also present. The main content area is divided into three columns: "Nieuws" (News), "Contact", and "Welkom op de site van Informatiehuis Water". The "Nieuws" column contains three news items, each with a date and a brief description. The "Contact" column provides contact information, including a phone number and an email address. The "Welkom op de site van Informatiehuis Water" column contains a welcome message and a link to the website. The browser's taskbar at the bottom shows several open applications, including "IHW - website", "Basisgegevens Kade...", "Partnership betwee...", "Optimalisatie.ppt", "Presentatie2", and "vervolgstappen". The system tray shows the time as 21:27.

IHW - website — Welkom bij Informatiehuis Water - RWS Waterdienst

http://www.informatiehuishuiswater.nl/

Bestand Bewerken Beeld Favorieten Extra Help

Favorieten http-atlas.gwsp.org-atlas-i... fema Are You Ready DNP » PortalWeb » Evento ... Richtsnoeren voor het schrij... nieuw VUNet - Studenten - ... The Columbia Heart Beat PU...

IHW - website — Welkom bij Informatiehuis Water

Informatiehuis Water
Een samenwerkingsverband van IPO, Rijkswaterstaat en Het Waterschapshuis

Proclaimer Abonneren Waterrapportagedag 2011

logo_transp2 >zoek uitgebreid zoeken sitemap

>Over IHW
>Nieuws
>Nieuwsbrieven
>Aquo
>Veelgestelde vragen
>Contact

Nieuws

>Waterrapportagedag 2011 (inschrijving gesloten)
Open de agenda en leg hem vast, de Waterrapportagedag 2011. Deze dag staat namelijk in het teken van de ontwikkelingen rondom de informatievoorziening van waterkwaliteitsgegevens. Iedereen die betrokken is bij het proces van inwinning, verwerking en rapporteren van waterkwaliteitsgegevens is van harte uitgenodigd.
26 oktober 2011


>Informatiehuis Water laat zich zien op Waternetwerkdag
Op 17 november 2011 vindt de Waternetwerkdag plaats. Dit jaar luidt het thema 'Innovatie verbindt'. IHW levert ook een bijdrage aan deze dag, namelijk in de vorm van drie workshops.
11 oktober 2011

>Aquo in distributielaag WaterDataNet
Binnen het programma WaterDataNet van Rijkswaterstaat wordt momenteel de zogenaamde distributielaag ontwikkeld. Monitoringgegevens uit de verschillende bronsystemen, zoals DONAR en LMW, worden via deze distributielaag aan afnemende systemen aangeboden. De aankomende periode wordt de basis gelegd, met de oriëntatie op een toekomstvastе gegevenslevering aan achtereenvolgens SeaDataNet, Aquo-kitportaal en het

Contact

Bezoekadres
Stationsplein 89
3818 LE Amersfoort
T  033 460 32 80 

Postadres
Postbus 2180
3800 CD Amersfoort

Contact
T  0320 29 89 99 
E servicedesk@ihw.nl

Welkom op de site van Informatiehuis Water
Welkom bij het Informatiehuis Water
Voor nu, maar ook voor later

Het welkom geldt voor iedereen
Met waterinformatie om zich heen

Laat al die info maar bij ons thuis komen
Wij laten de data in de juiste richting stromen

Internet 100%

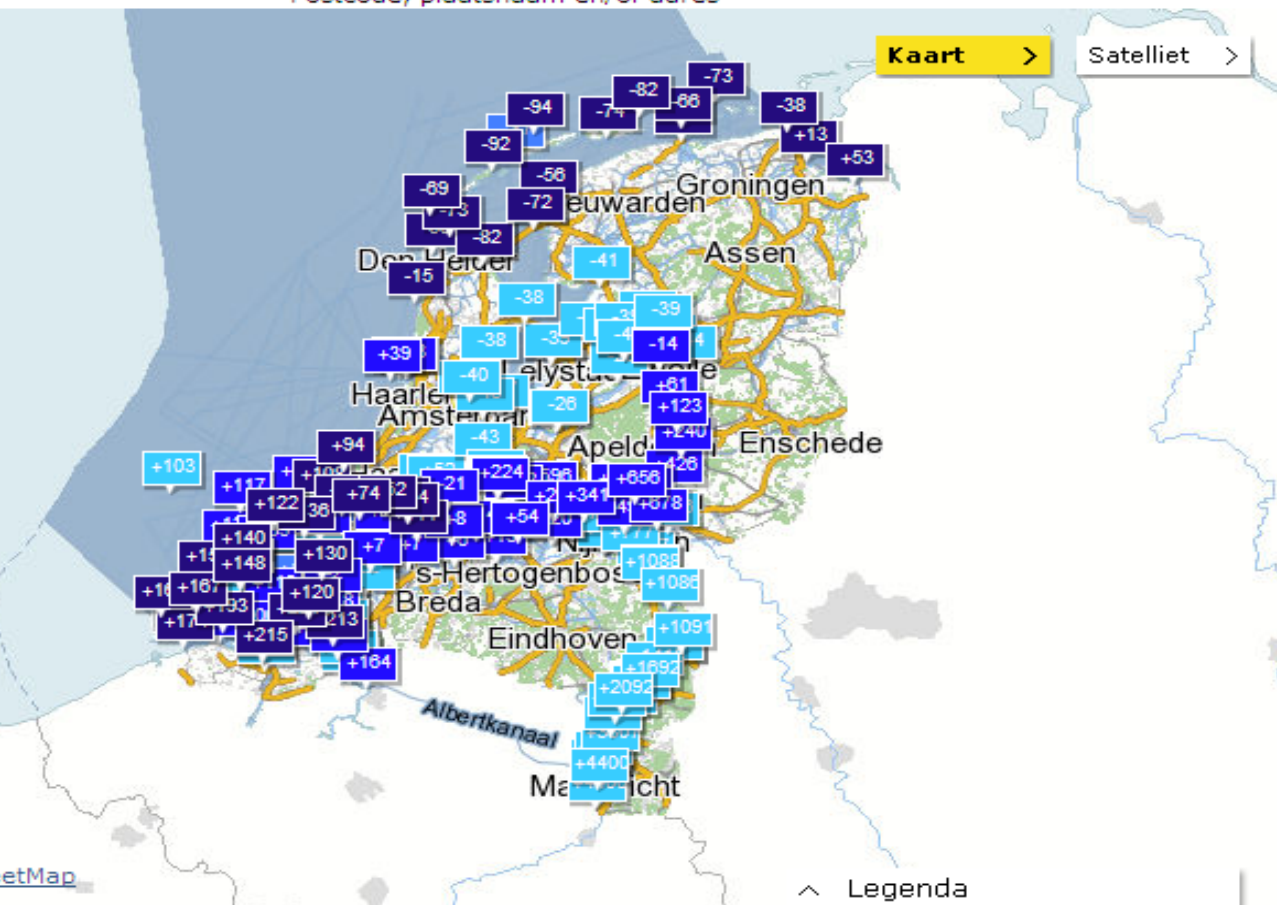
Start IHW - website ... Basisgegevens Kade... Partnership betwee... Optimalisatie.ppt Presentatie2 vervolgstappen Draadloze netwerk... 21:27

in onderstaand keuzemenu wordt automatisch uitgevoerd.

Categorie: Water Selecteer kaart: Waterstand ten opzichte van NAP

Adressen Griffioenlaan 2 Utrecht Zoek > Link

Postcode, plaatsnaam en/of adres



Print Stuur door

Handleiding

Bekijk de Handleiding Kaarten.pdf (178 Kb)

Weergave

Tabelweergave

Gerelateerde informatie

- > Actuele waterdata
- > Monitoring en meetsystemen
- > Getijvoorspellingen
- > Hydro- en meteoverwachtingen

Referentiewaarden waterstanden.pdf (1,2 Mb)

TAW en NAP

Het Belgische referentievlak TAW (Tweede Algemene Waterpassing) ligt 2,33 meter lager dan het NAP (Normaal Amsterdams Peil): TAW = NAP - 2,33 meter. Waterstanden weergegeven ten opzichte van TAW zijn dus juist 2,33 meter hoger dan dezelfde standen ten opzichte van NAP.

Vragen?

[Home](#)

Uw selectie in onderstaand keuzemenu wordt automatisch uitgevoerd.

Andere categorie:

Selecteer kaart:

Zoek locatie:

[Link](#)

Postcode, plaatsnaam en/of adres



[Print](#) [Stuur door](#)

Handleiding

[Bekijk de Handleiding Kaarten.pdf \(178 Kb\)](#)

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[Tabelweergave](#)

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Vragen?

[Uitbreid uw website](#)

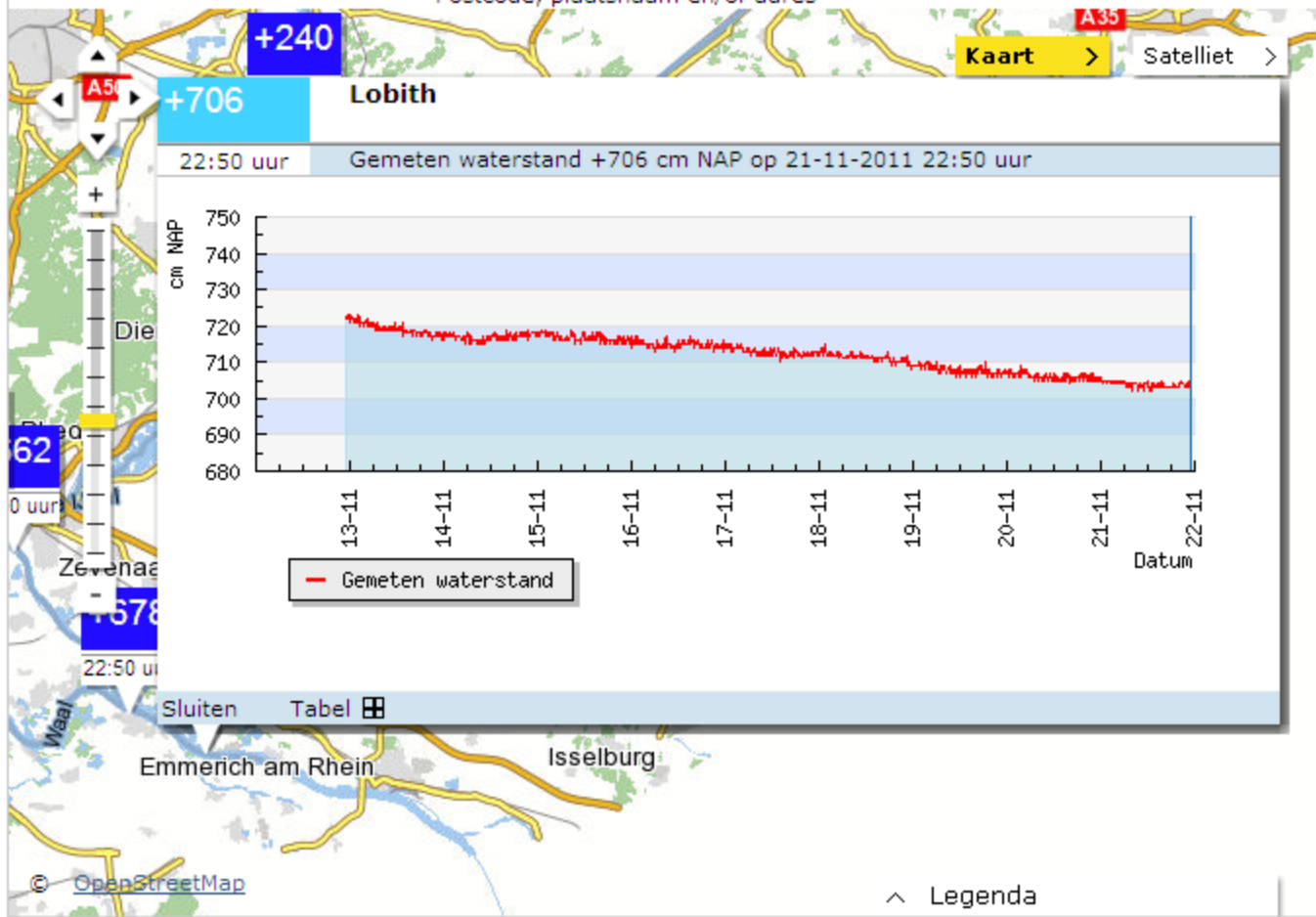
[Home](#)

Uw selectie in onderstaand keuzemenu wordt automatisch uitgevoerd.

Andere categorie: Water Selecteer kaart: Waterstand ten opzichte van NAP

Zoek locatie: Adressen Zoek > Link

Postcode, plaatsnaam en/of adres



Print Stuur door

Handleiding

[Bekijk de Handleiding Kaarten.pdf \(178 Kb\)](#)

Weergave

[Tabelweergave](#)

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[Referentiewaarden waterstanden.pdf \(1,2 Mb\)](#)

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Vragen?

Legenda

Algea-toxicity of Rhine water

New Page 2 - RWS Waterdienst

http://www.aqualarm.nl/Aqualarm/Grafiek.irpt?ParamCode='ALGI'&ReportCode=''&LocationCode='LOBI'&ParamName='Algbewaking'&StartDate=25-10-2011 00:00:00

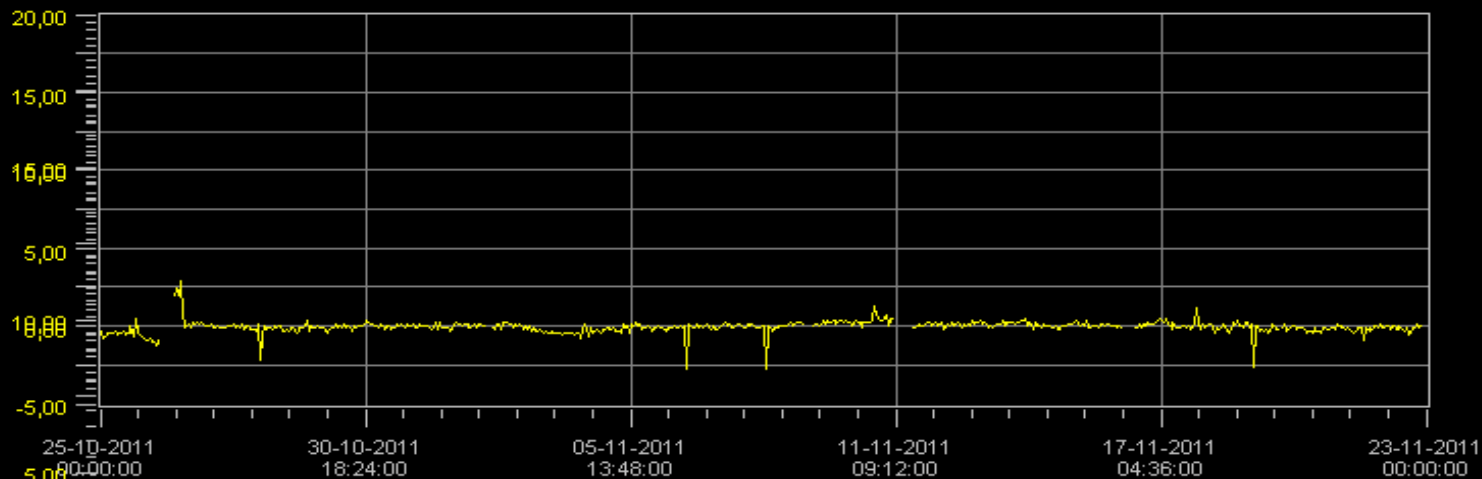
stand Bewerken Beeld Favorieten Extra Help

Favorieten http--atlas.gwsp.org-atlas-i... fema Are You Ready DNP » PortalWeb » Evento ... Richtsnoeren voor het schrij... nieuw VUnet - Studenten - ...

New Page 2

16-11-2011 22:06:07 : 20,00

■ Lobith_Algbewaking_ALGI_Tox-ini ■ Lobith_Algbewaking_ALGI_Tox-index (0,34)



Navigation controls: Home, Full Screen, Print, Previous, Next, Play, Stop, Refresh, and a search icon.

Time range: 25-10-2011 00:00:00 to 23-11-2011 00:00:00

Bathing water quality in province of Flevoland

The screenshot displays the website 'Zwemwater Flevoland - RWS Waterdienst' in a web browser. The browser's address bar shows the URL 'http://zwemwater.flevoland.nl/'. The website's header includes the 'PROVINCIE FLEVOLAND' logo and the text 'Digitaal Loket Flevoland Zwemwater locaties'. A navigation menu on the left contains 'Home' and 'Contact'. A small inset image in the top right shows people swimming in a lake. The main content area features a map of the province of Flevoland with blue dots indicating swimming locations. The map includes labels for various cities and towns such as Schagen, Medemblik, IJsselmeer, Almere, and Zwolle. A scale bar at the bottom left indicates 10 miles and 20 kilometers. The footer of the website contains links for 'Proclaimer', 'Contact provincie', 'Sitemap', and 'ROV-KGO 100027'. The browser's taskbar at the bottom shows several open applications, including 'Zwemwater en blauwa...', 'Zwemwaterkwaliteit - ...', and 'Zwemwater Flevola...'. The system clock in the bottom right corner shows the time as 21:27.

Actual situation on a specific point

Zwemwater Flevoland - RWS Waterdienst

http://zwemwater.flevoland.nl/

Bestand Bewerken Beeld Favorieten Extra Help

Favorieten http--atlas.gwsp.org-atlas-i... fema Are You Ready DNP » PortalWeb » Evento ... Richtsnoeren voor het schrij... nieuw VU.net - Studenten - ... The Columbia Heart Beat PU...

Zwemwater Flevoland

PROVINCIE FLEVOLAND

Home Contact

Digitaal Loket

Flevoland Zwemwater locaties

Zwemmen Meetpunt Kwaliteit

Zilverstrand

Kwaliteit: Goed

Faciliteiten

- Parkeergelegenheid: Ja
- Entree: Ja
- Toilet: Ja
- Restaurant, snackbar, paviljoen: Ja
- Drijflijn: Ja
- Geleidelijk aflopende bodem: Ja
- Zandstrand: Ja

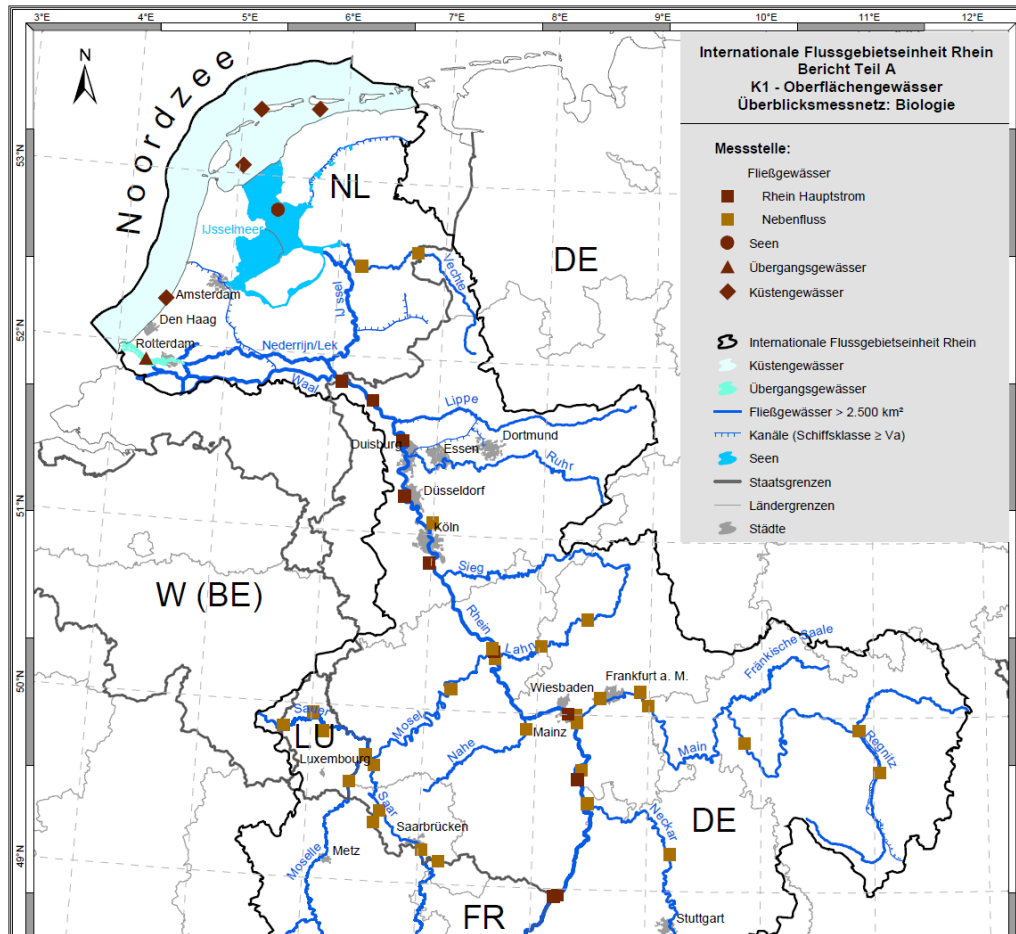
Route...

Zwemwaterlocaties in Flevoland

Proclaimer | Contact provincie | Sitemap | ROV-KGO 100027

Start Waterdienst - Home - ... https://webaccess.mi... https://webaccess.mi... Zwemwater en blauwa... Zwemwaterkwaliteit - ... Zwemwater Flevola... Microsoft PowerPoint - ... NL 21:30

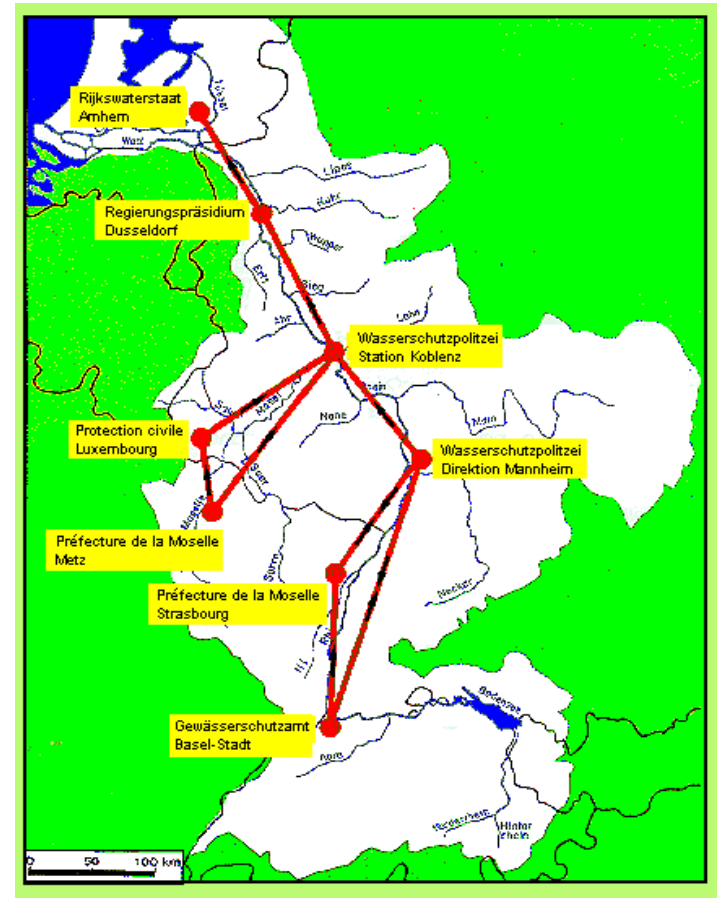
River Rhine: Main monitoring network biology



Warning- and alarmplan Rijn

Appointments about:

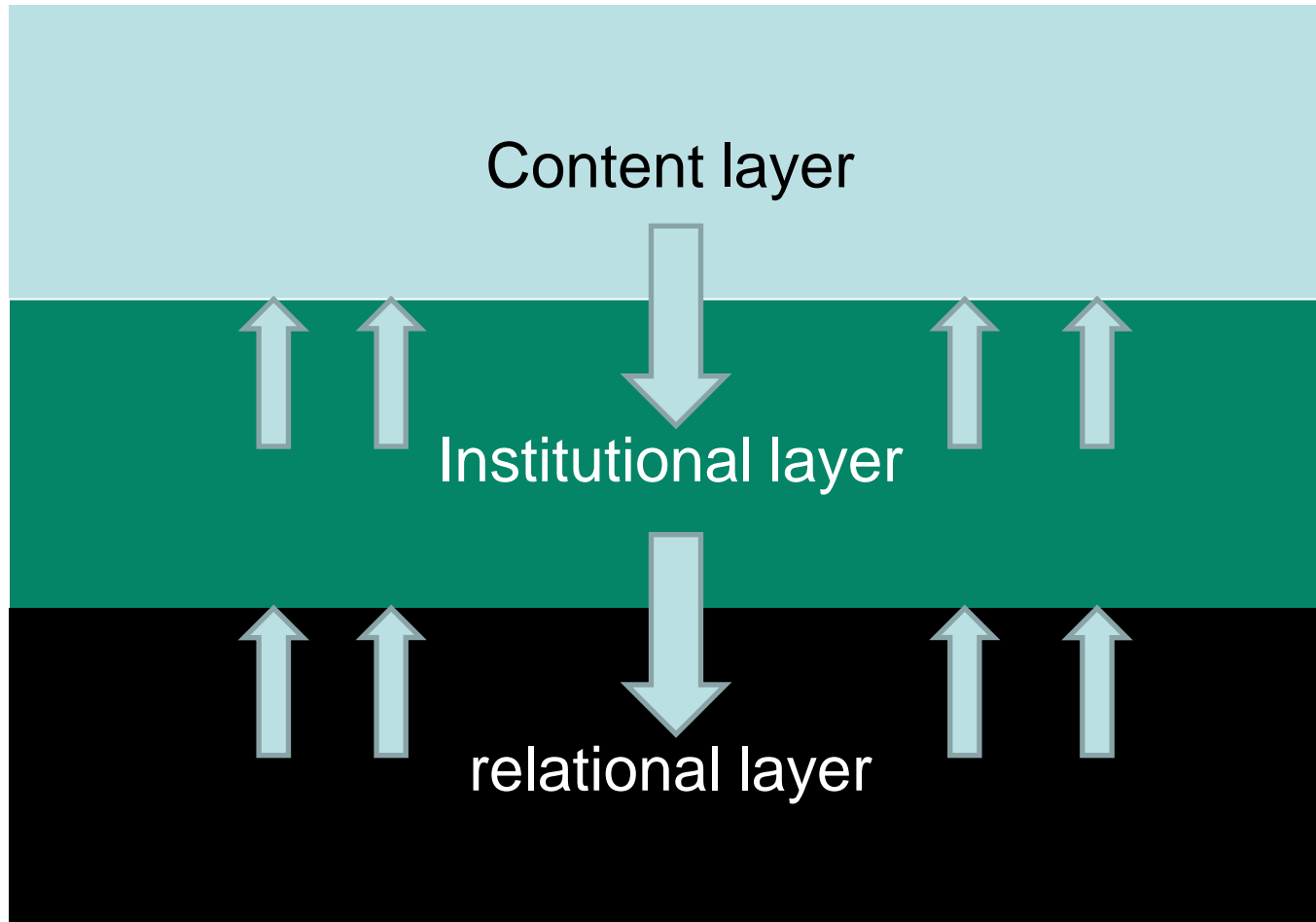
- Informing/warning
- Who and when
- 7 Main Warning Centres
- Format voor communication
- Minimum information
- Ask for searching source
- Evaluation en rapporting
- Jearly report
- Regular exercise/workshop
- 3^e level



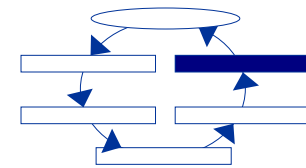
Alarm Monitoring Rhine

- **Reasons for Releasing Warning and Alarm Service Rhine:**
 - information by discharger
 - observations at site (e. g. fish kills)
 - measurements at monitoring sites
- **Evaluation of Relevance:**
 - authority supported by agencies with their experts (e.g. state offices)
 - means: flow time model, data bases for hazardous substances, alarm thresholds for concentrations
- **Warning/Information and End of Alarm:**
 - authority is responsible for decision
 - IMWC is responsible for information transfer

Success depends for a big part on good working relations based on trust



Impact-of-information chain



**produced
information**

data
statistics
maps
graphics
reports
books
web pages



**is communicated
through**

shops
libraries
the Internet
mass media
NGOs
schools
analysts



**to form awareness, opinions
and attitudes among**

law-makers
rule-makers
money-makers
choice-makers
future-makers



**for catalysing
environment-
friendly**

laws
policies
organisations
investments
production
consumption
values



causing

lower pressure on the
environment and
therefore its better
quality

(Denisov and Christoffersen 2000)

Thank you for your kind attention

