



Regional Association VI, Forum Hydrology,
Koblenz, May 8 – 10, 2012

Statements of the national hydrological
service of The Netherlands

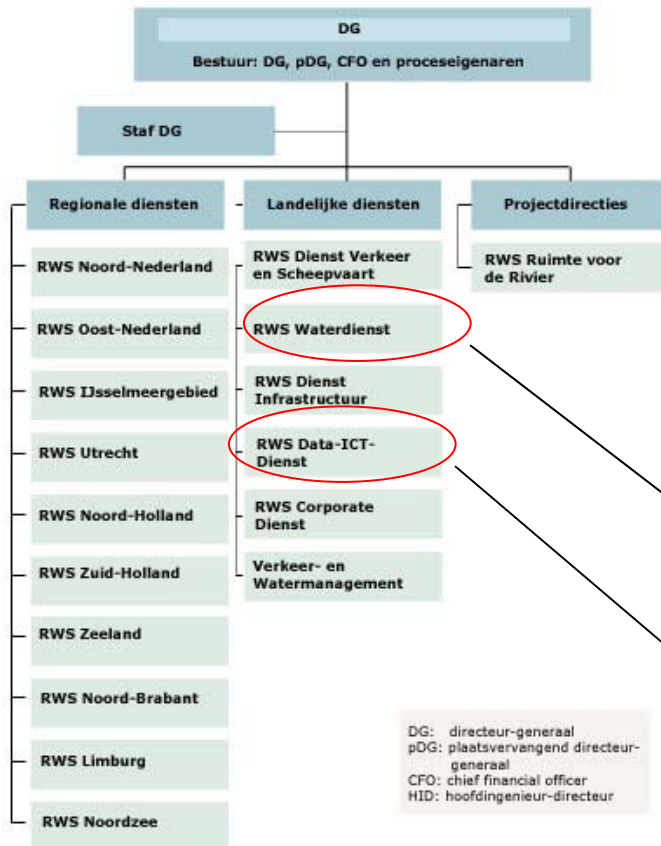
Peter Heinen

Rijkswaterstaat

Centre for Water Management



Rijkswaterstaat



- Part of the Ministry of Infrastructure and Environment
- Big organisation (9000 fte)
- Main tasks
 - Protection against flooding
 - Enough and clean water
 - Congestion and safety of transport
- 10 regional services: implementation of the traffic- and watermanagement
- 6 national services, 2 responsible for provision of information for the main tasks of watermanagement (national waters)
 - Centre for Watermanagement
 - Demand, budget
 - What kind of information is needed and what are the requirements
 - Centre for Data and ICT
 - Supply
 - Management of the hydrological monitoring network



Biggest success

- Implementation of Information management
 - Demand and supply separated
 - Information needs and requirements are known
 - Information strategy
 - Measurements
 - Measurements from external organisation
 - Modelling
- Integration of regional monitoring networks to a national network (national waters)
- Integration of monitoring programs in the salt coastal and fresh inland waters



Biggest failure/worried about

- Less experience and knowledge in the organisation
- Investments are necessary for changes
- Implementation of innovation (takes a long time)
- Outstanding maintenance



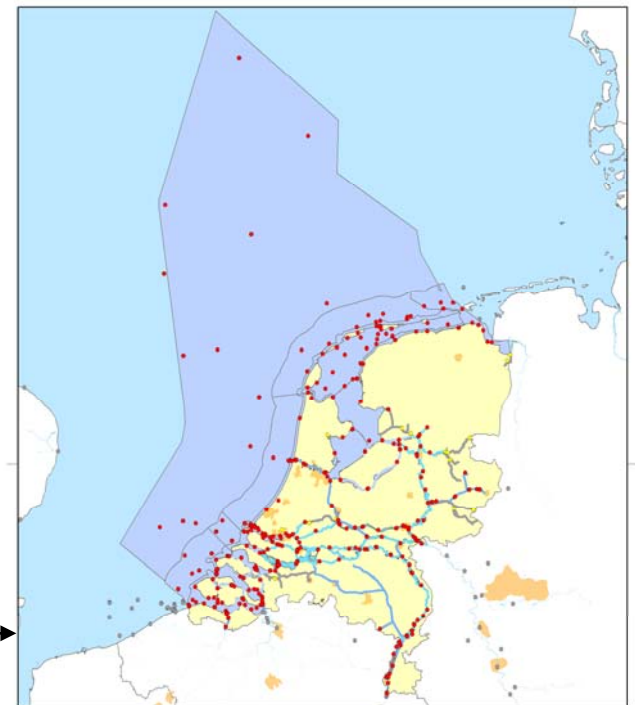
Expectations

- Optimise cross-border exchange of hydrological information
 - For Hydrological Forecast (flood warning) we need and get data from abroad
- Working together at the borders
 - Example: discharge measurements



General features of the hydrological monitoring network in the Netherlands

- Objectives of hydrological monitoring
 - Knowledge of the watersystem for policy preparation en evaluation
 - Long term changes (sea level rise, climate change)
 - Statistics (bank design)
 - International coöperaton and legal requirements
 - Operational watermanagement
 - Reporting (flood warning)
 - Level regulation and water distribution
 - Navigation (seaports and inland)
- Parameters
 - Waterlevels
 - Discharge
 - Water temperature
 - Waves
 - Current
 - Meteorological parameters at the Northsea
- Measurements at 400 locations





Locaties waterstand in het Landelijk Meetnet Water in Nederland

Legenda

- LMW locaties waterstand
- LMW locaties
- Kanalen
- Rivieren
- Kustwateren; Meren en plassen
- KRW waterlichamen overig

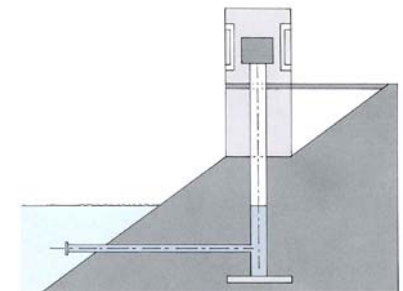
Datum: 17-04-2012
Kaartnummer: RWSWD20120026

Schaal: 1:3.000.000
0 25 50 100
Kilometers

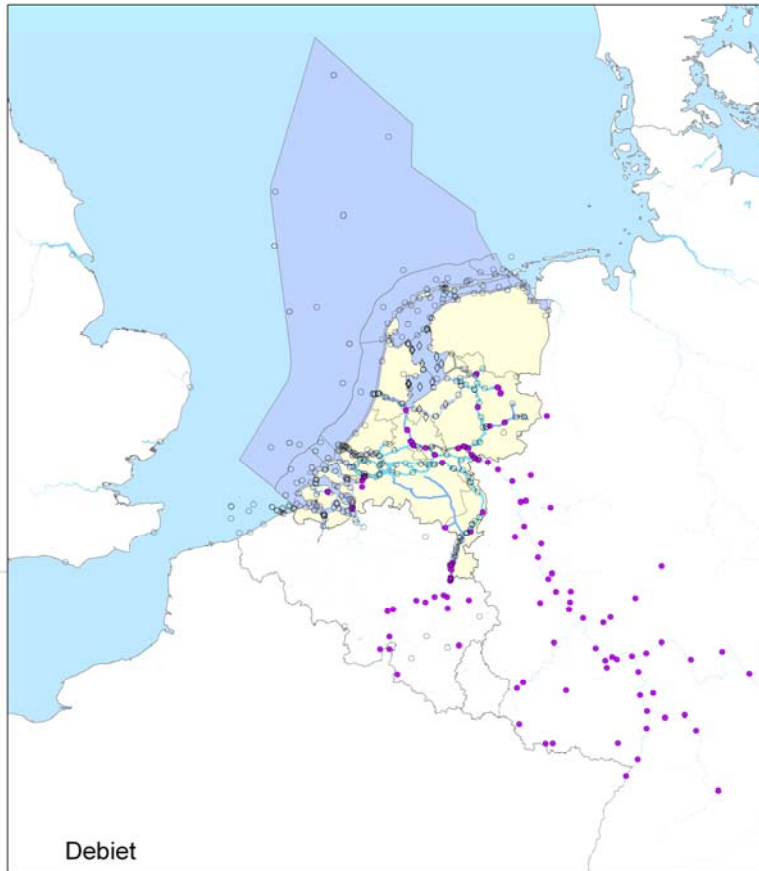
Ministerie van Infrastructuur en Milieu
Rijkswaterstaat
Waterdienst

Water Level monitoring network

- DNM (driver/float system)
- Radar
- Statistical models (MLR)
- Hydrological models
- Data from Germany, Belgium, France and the UK



Rijkswaterstaat



Debiet

Locaties debiet in het Landelijk Meetnet Water in Nederland

Legenda

- LMW locaties debiet
- LMW locaties
- Kanalen
- Rivieren
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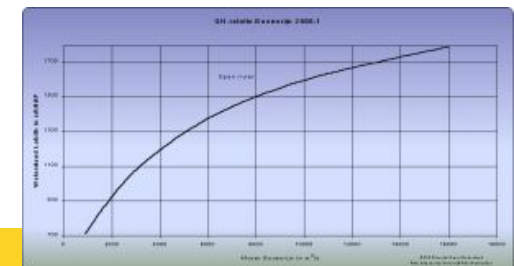
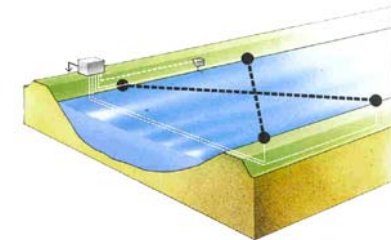
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Schaal: 1:3.000.000
0 25 50 100 Kilometers



Discharge monitoring network

- ADM (Acoustic Discharge Gauge)
- H-ADCP
- Discharge-waterlevel relation
- Information from discharge sluices
- Hydrological models
- Data from Germany, Belgium and France



Rijkswaterstaat



Examples of measurement constructions



Tube at sea



Tube along the coast



Platforms at the North Sea



Measurement building



Discharge and waterlevel at Lobith



Tube along a river (Waterlevel)



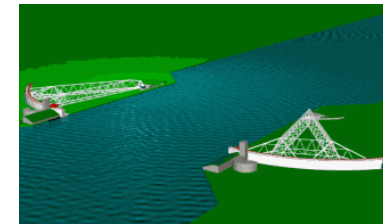
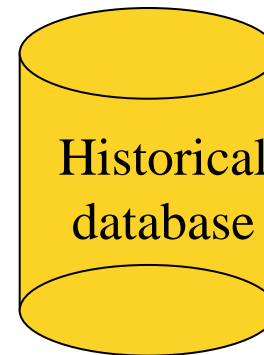
Wave buoy



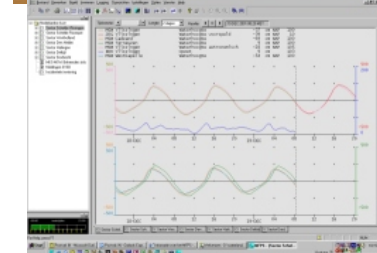
Direct lines to important objects such as the storm surge barrier

Distribution of the data to the users

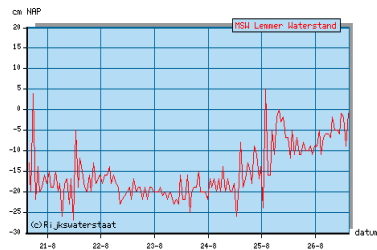
- Users:
 - work process of Rijkswaterstaat
 - professional users
 - public
- Development: uniform and standard



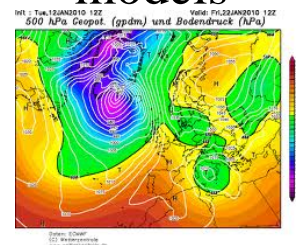
MFPS



Internet



Input for hydrological models



Teletekst

720 Teletekst do 26 aug

WATERSTANDEN rivierennummers 1211

donderdag 26 augustus 15.20 uur

7 uur				
Lobith	870	875	Ranspolderbrug	8
Pannerden	844	845	Kadoelen	1
Nijmegen	662	660	Zwartsl. bu	18
Tiel Waal	378	376	Spooldersl-b	18
IJsselkop	821	821	Kornw.znd bl	-1
Oriel boven	822	822	Den Oever bi	-2
Doesburg	608	608	Krabbersg.z	-16
Zutphen	405	404	Houtrib N	4
Katerveer	51	61	Schel.w.brug	-20
Kampen	7	20	Surinamekade	-28
Eijsden	442	442	Imuidensl.0	-48
Borgharen	388	383	Maarsen	-3
Heel ben	1419	1425	Amerongen bo	-6
Belveld ben	1104	1126	Hagstein bo	31
Sambeek ben	778	788	Rak zuid	-3
Megen	491	493	Kreekrak N	-3

Bron: RWS Gegevenscentrum 070-3114333

volgende nosnieuws index nossport



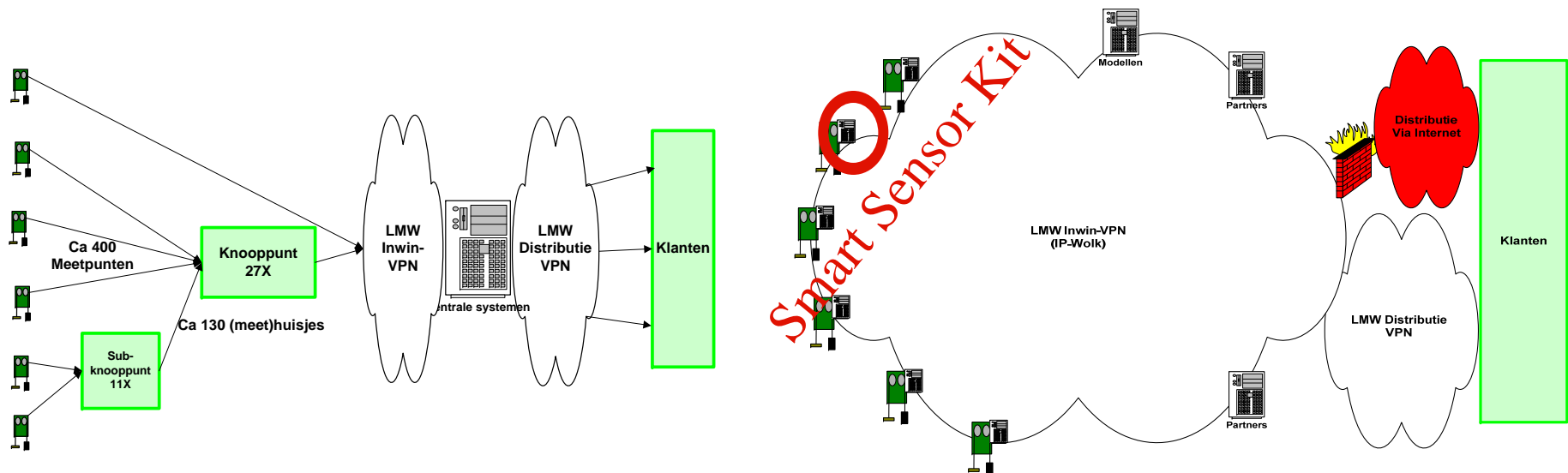
Main challenges and developments

- Working together within the Ministry
 - National Meteorological institute
 - Monitoring network of air quality
- Working together with the Water Boards (regional waters)
 - National Monitoring Network
- Differentiation in users and requirements
 - Most important users priority and guaranteed data conform agreed requirements
- Optimisation of the monitoring network using hydrological models
- New design and structure of the technical network



New design and structure of the technical network

- Cheaper
- No longer 1 point of failure
- SWE and smart sensors, plug-in, flexible
- Easier to work together with other organisations





Thank you for your attention

