



Rijkswaterstaat
Ministerie van Verkeer en Waterstaat

The road and hurdles towards GEP for large rivers in the Netherlands

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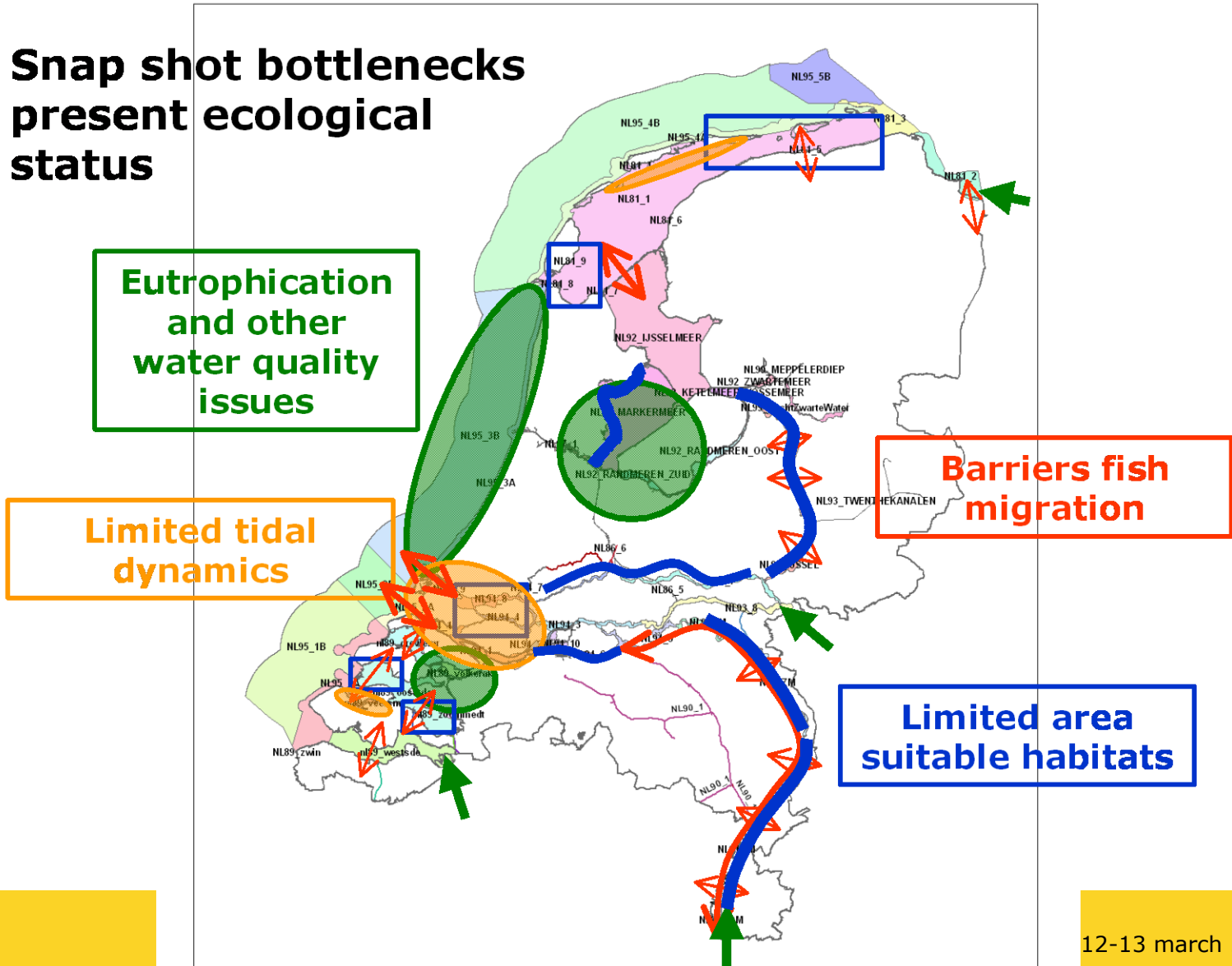
Content

- State managed waters in the Netherlands
- Snap shot on major water quality issues in state managed waters
- Working process for derivation of GEP
- Specific examples
- Overview results
- Final remarks





Snap shot bottlenecks present ecological status





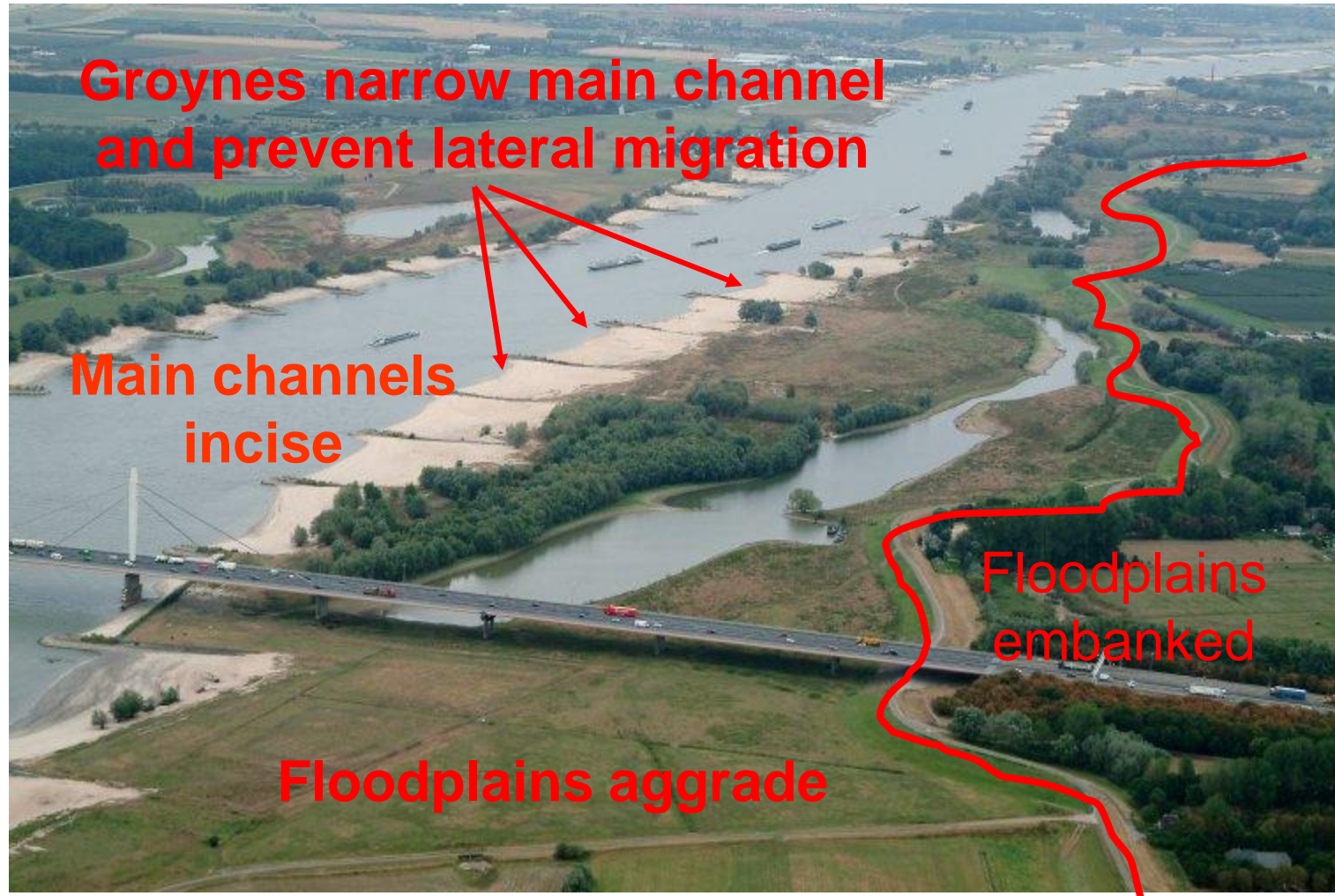
All water bodies followed a standard working process to derive GEP

1. Monitoring & establishing present state (EQR)
2. Ecologically significant hydromorphological alterations
3. Rehabilitation and mitigation measures
4. Stakeholder consultation on measures
5. Ranking measures on basis of effectiveness
6. Estimating effect (on a reach-scale) on waterbody scale
7. Incorporating diagnosis for nutrient reductions
8. Comparison STEP 6 + 7 to present status
9. External quality check → some adjustments
10. Draft WMP (+RBMP) for public consultation

STRUCTURED, SPECIFIC, TRANSPARENT



Rivers : Many hydromorphological pressures





Rivers & transitional waters; always irreversible alterations

Hydromorphological modification	Total # of water bodies	5	4	3	2	1
Embankments	23	21	0	0	2	0
Shore protection	23	10	11	0	2	0
Loss of active floodplain	21	6	15	0	0	0
Normalisation	18	17	1	0	0	0
Canalisation	13	11	2	0	0	0
Groynes	15	12	0	0	0	3
Sluices and weirs	12	7	1	2	2	0
Impoundments	11	8	2	0	0	1

No significant effect on ecology

No essential constraint to achieve good ecological status

Intention to restore, rehabilitate or mitigate

Possible to restore, rehabilitate or mitigate

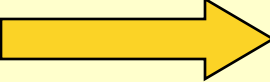
Irreversible modification

All large rivers are designated as heavily modified and can only to a limited part be rehabilitated



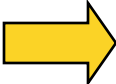
WFD: Large programme of effective measures on rehabilitation & mitigation

Change in type of river results in change in type of measures



Large fast-flowing river over gravel
Large slow-flowing rivers over sand or clay
Large tidal rivers
Transitional waters
Total

	#	1	8	8	5	
Water bodies						
Channel widening	ha	333				333
Lowering aggraded floodplains	ha	179	638	462		1278
Natural riparian zone	km	10	234	55	5	304
Rehabilitation of tributary mouth	sites	8	73	8		89
Fish diversion hydropower	sites		3			3
Side channels (flowing, 2-sided connected)	km		61	8		69
Connected backwater (non-flowing, 1 sided connected)	km		62	10		72
Riverbed sanitation	ha		33	1446	830	2308
Fish passages	sites		7	17	20	44
Enlarging active floodplain	ha			202	20	222
Tidal creeks	ha			325	10	335
Adjusted management of the Haringvlietsluices	sites				1	1





Programme: Room for the Rivers

Floods 1993 & 1995



Relocating embankments

Adjusting groynes

Lowering floodplains

Enlarging active floodplains

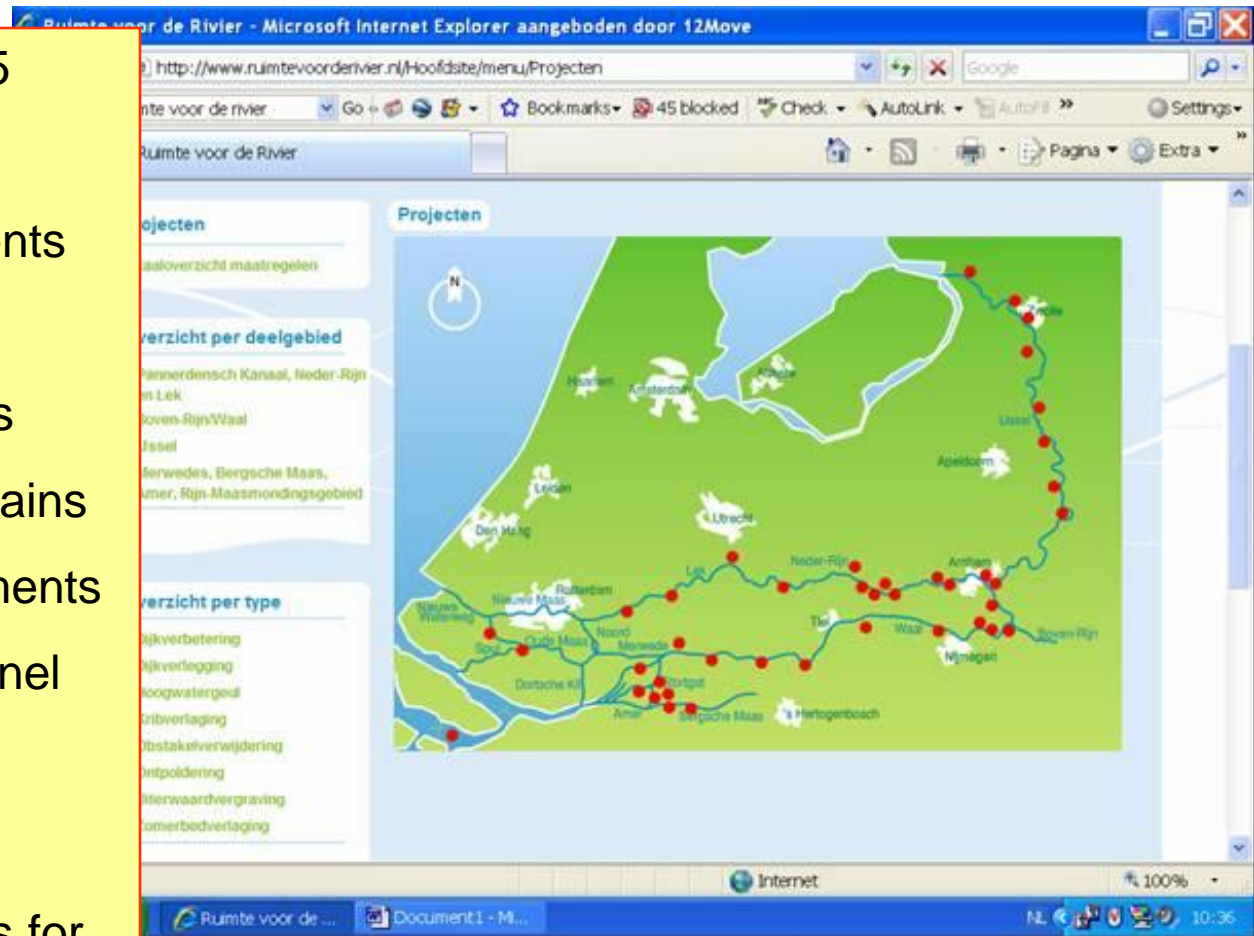
Strengthening embankments

Deepening main channel

Flood channels

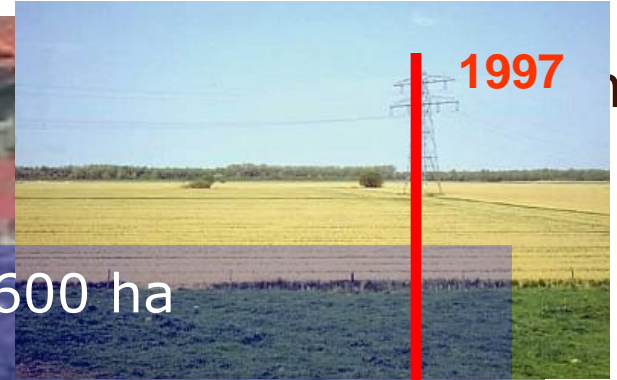


Win – Win opportunities for ecological rehabilitation





- Enlarging active floodplains with 600 ha
- Gates in embankments
- Flooded several times per year
- Sparsely populated -> individual houses protected
- Agriculture -> Nature Freshwater tidal channels
- Official start May 2008 (Crown Prince, Minister, Mayor) -> significance of the project



2003



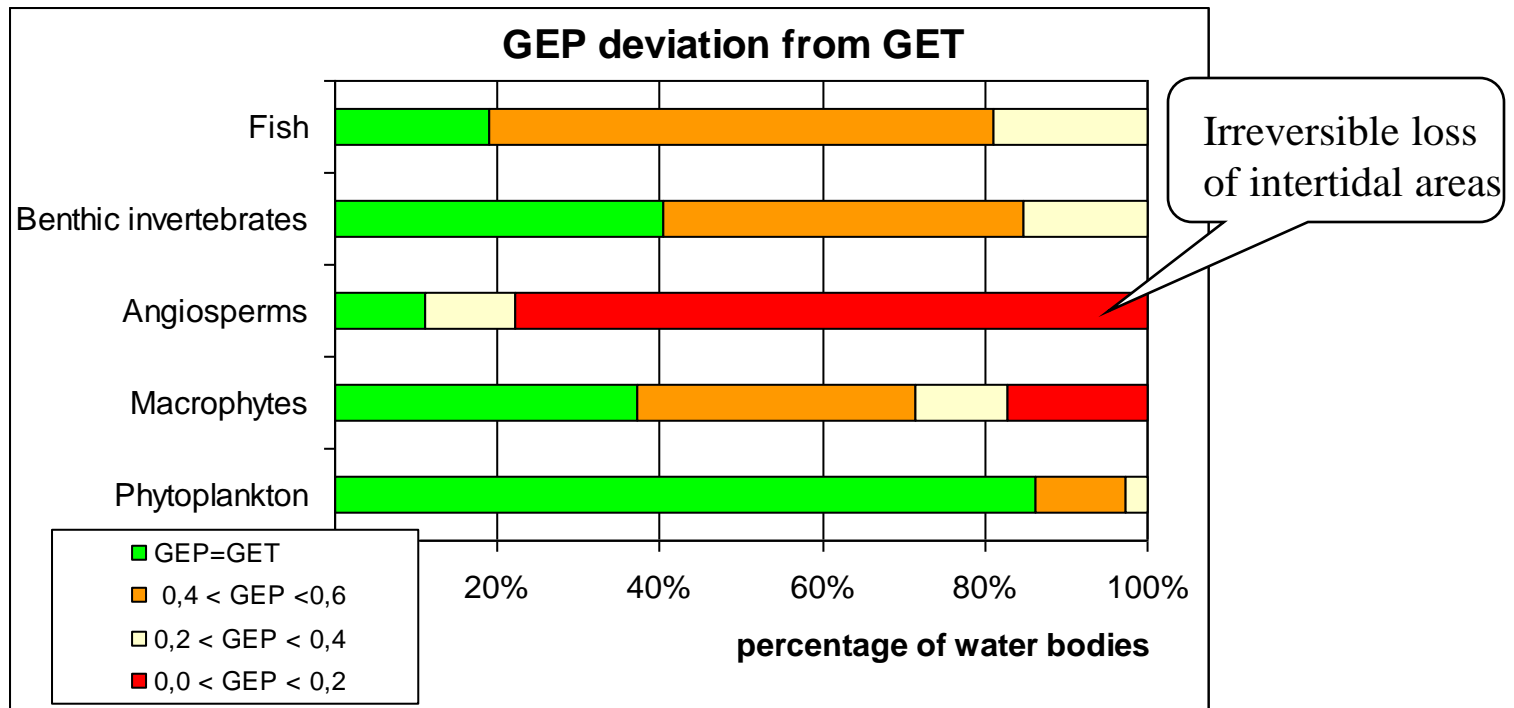


Expert judgement for estimating effects

- All types of measures are ranked for effectiveness per biological quality element
 - E.g. benthic invertebrates benefit from riverbed sanitation
 - E.g. migratory fish benefit from adjusting management sluices
- Estimation of improvement on water body scale
 - Improving water quality is beneficial for whole water body
 - E.g. enlarging active floodplains is only possible at specific sites; this means the combination of scale/whole waterbody + effectiveness type measures → estimated improvement
- Peer review on expert judgement
 - External quality check → some adjustments
 - No intercalibration for large waters available
 - Looked for international comparison (2007, not yet available)



Overall: GEP does not deviate a lot from GET



One out, all out: per waterbody there is mostly a BQE that cannot meet GET



Final remarks

- Many water bodies in the NL are artificial or heavily modified
 - That is a result of typical situation in the Netherlands,
 - However, we have agreed on a large and costly additional programme of measures to rehabilitate or mitigate effects
 - In combination with flood defence programmes, where win-win is possible
- A stepwise approach was followed for elaboration of GEP
 - Structurised, specific and transparent
 - Expert judgement based, but with external quality checks
- GEP in general slightly deviates (maximum one class) from GET
- Invitation to share results & methods for large waters to make an international comparison