Ecosystem services and Natural Capital for the large Dutch water bodies

Water JPI TAP

Dublin, June 12th 2019

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RWS, Netherlands

- Intro Rijkswaterstaat
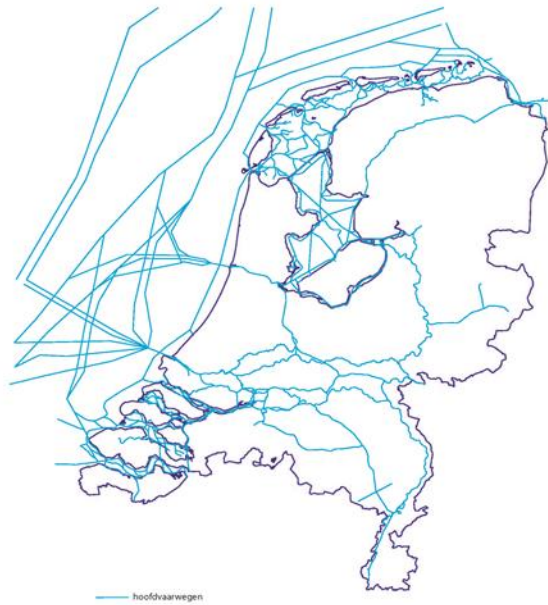- Examples and pilot projects
- Handbook

Rijkswaterstaat, > 200 years experience

- Founded in 1798 when a major plan was adopted to take control of public works and water management in the Batavian Republic (1795-1801)

- All matters concerning public works and water management are dealt with in a central way

Batavian Republic in 1798

Rijkswaterstaat

hoofdwegen

hoofdvaarwegen

Saba
Sint
Eustatius

Bonaire

Hoofdwatersystemen

Rijkswaterstaat's mission

Rijkswaterstaat operates to ensure

- protection against flooding
- sufficient clean water
- smooth and safe transport by road and water
- reliable and useful information
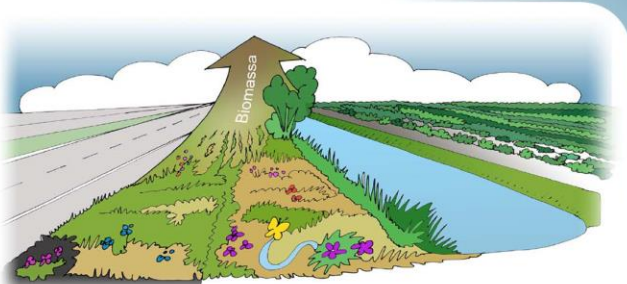- a sustainable living environment

Water Works 2015

RWS adds value to natural capital by …
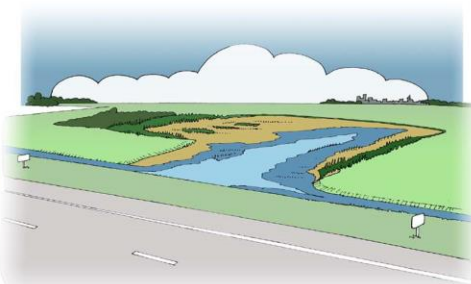
...circulair grondstoffengebruik

...biodiversiteit te versterken

...meer ecosysteemdiensten mogelijk te maken

...een volledig duurzaam eigen energieverbruik

...meer waterberging op eigen gronden
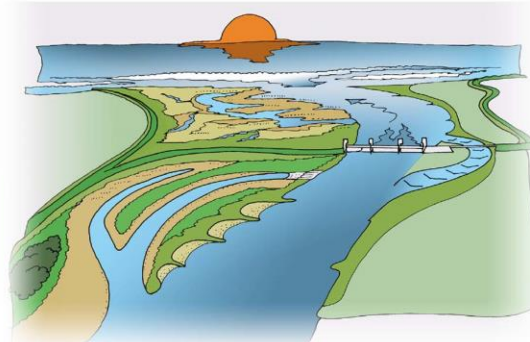
...te streven naar een natuurlijk watersysteem

...bagger nuttig te gebruiken

An eaxmple

► TIDE

Ecosystems and biodiversity | Human well-being

Structures and processes — Functions — Ecosystem services — Benefits — (Economic) Value

Morphology → Water for navigation

Dissipation of tidal energy

Water quality regulation

Supply — Demand

Example Schelde

Tidal River Development
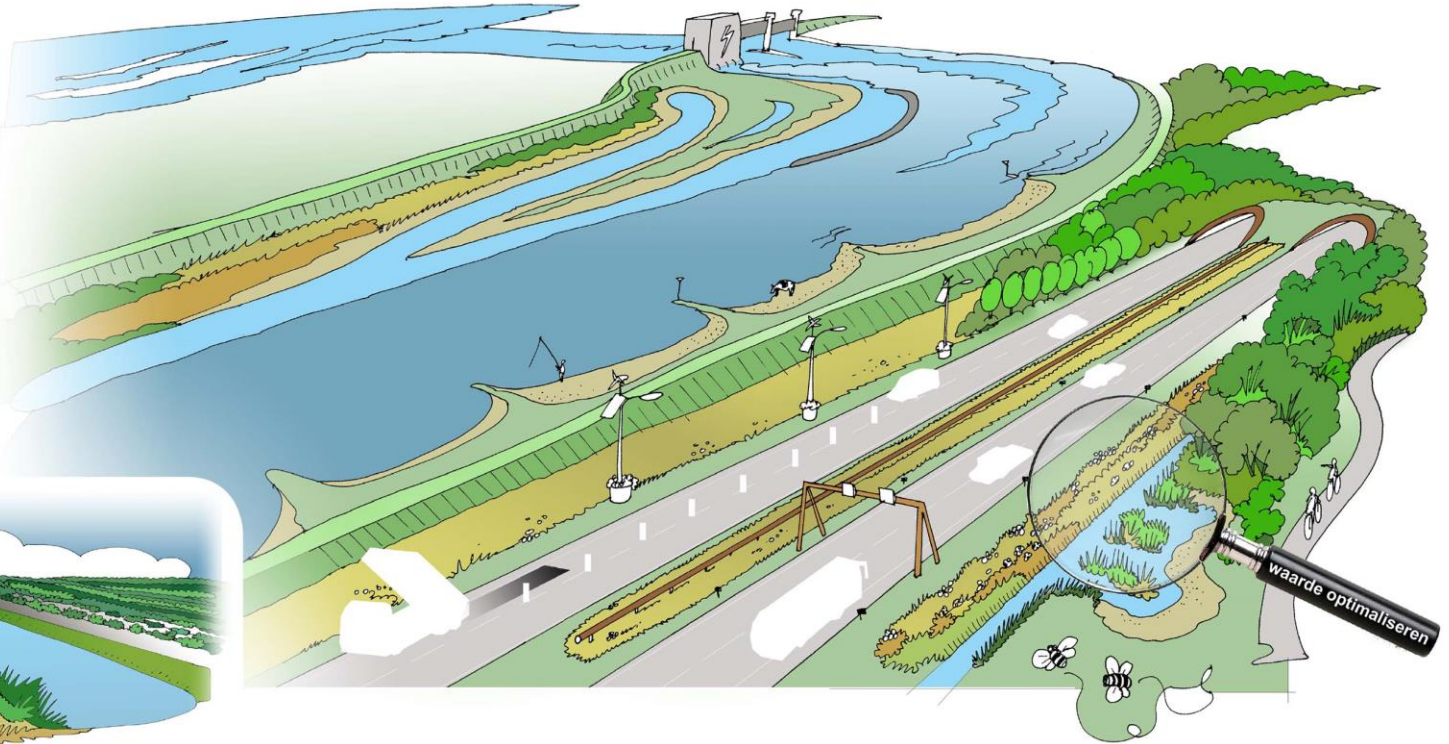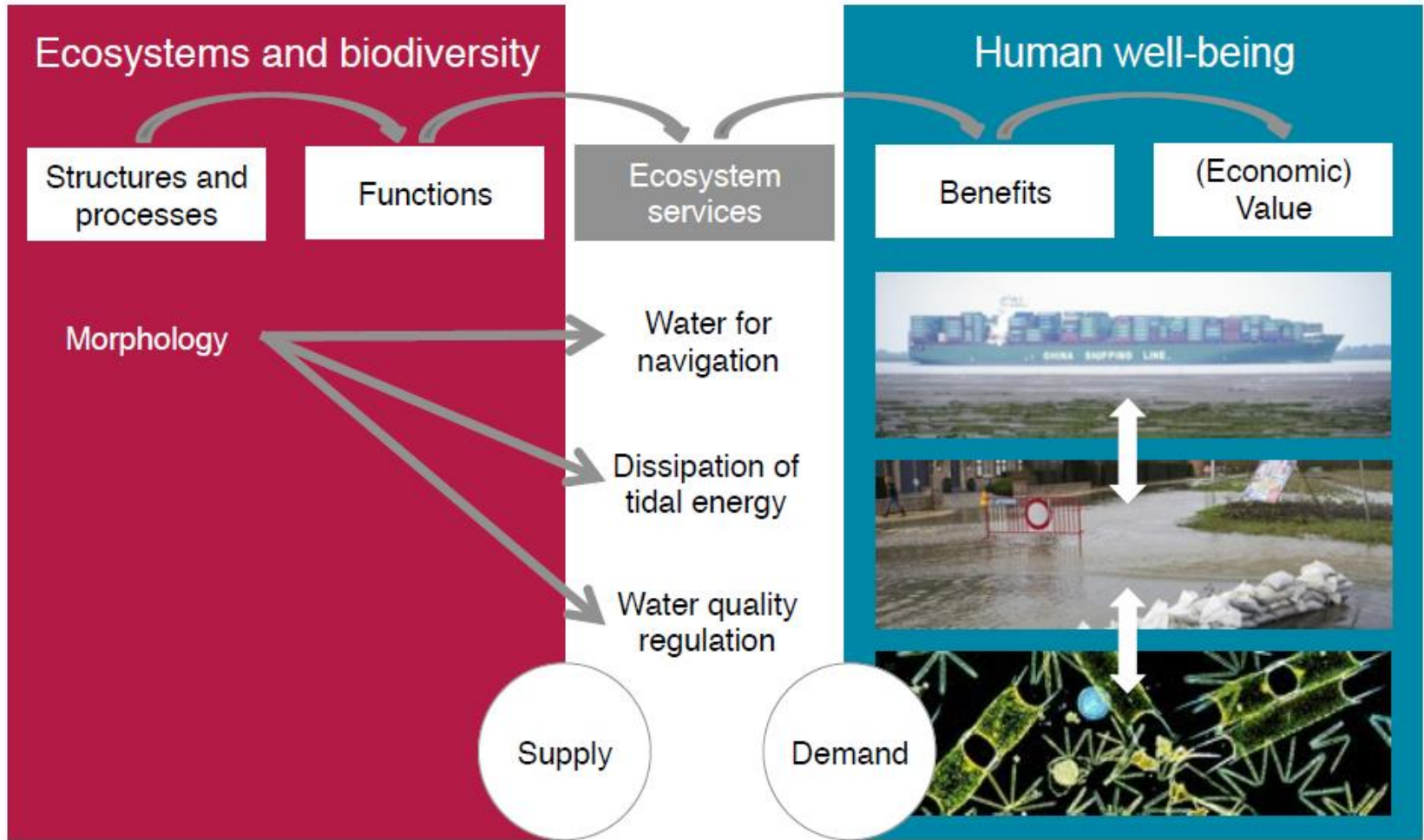
From ecosystem services to management practice

Can ES help us to decide on which measures, management to take?

APPROACH

Step 1: Habitat change by the measure

Habitat-Ecosystem service matrix (ecosystem service supply per habitat)

Step 3: Expected impact on ecosystem services

Step 2: Indicate targeted ecosystem service

Result: Expected benefits and co-benefits
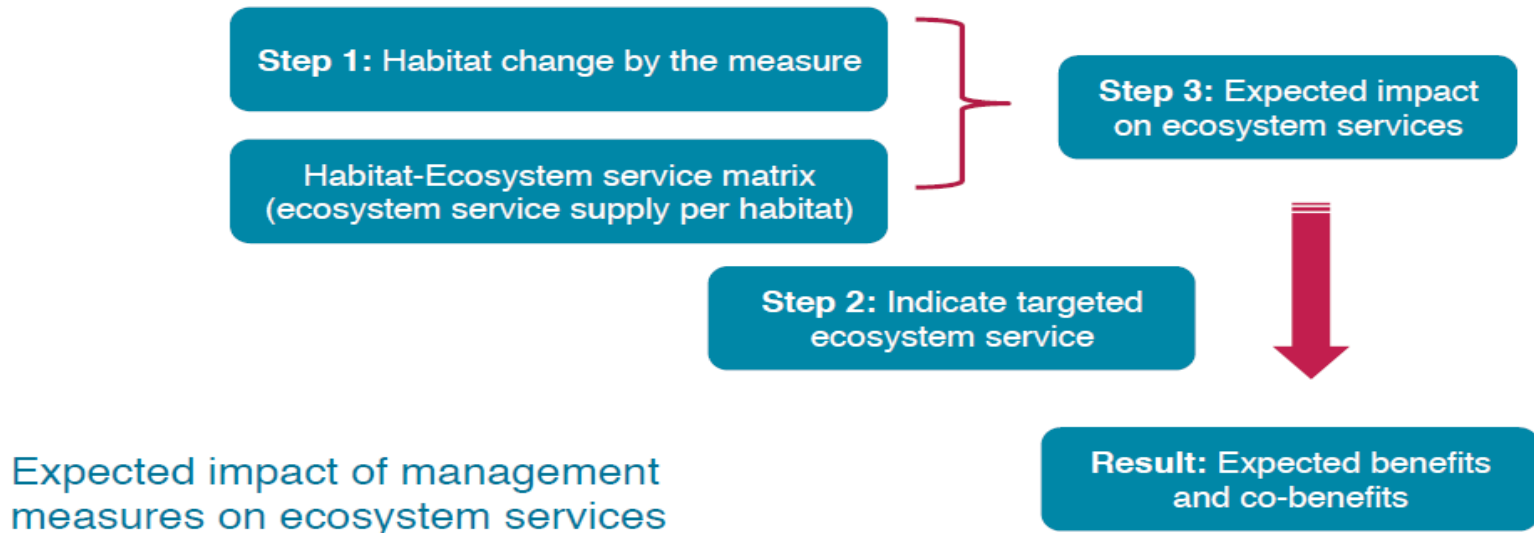
Expected impact of management measures on ecosystem services

Legend: expected impact*

3	very positive
2	positive
1	slightly positive
0	neutral
-1	slightly negative
-2	negative
-3	very negative

X	Targeted ES

Ecosystem services

Column definitions:
- S: "Biodiversity"
- R1: Erosion and sedimentation regulation by water bodies
- R2: Water quality regulation: reduction of excess loads coming from the catchment
- R3: Water quality regulation: transport of pollutants and excess nutriënts
- R4: Water quantity regulation: drainage of river water
- R5: Erosion and sedimentation regulation by biological mediation
- R6: Water quantity regulation: transportation
- R7: Water quantity regulation: landscape maintenance
- R8: Climate regulation: Carbon sequestration and burial
- R9: Water quantity regulation: dissipation of tidal and river energy
- R10: Regulation extreme events or disturbance: Wave reduction
- R11: Regulation extreme events or disturbance: Water current reduction
- R12: Regulation extreme events or disturbance: Flood water storage
- P1: Water for industrial use
- P2: Water for navigation
- P3: Food: Animals
- C1: Aesthetic information
- C2: Inspiration for culture, art and design
- C3: Information for cognitive development
- C4: Opportunities for recreation & tourism

Estuary	Measure	Zone	Categ.	S	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	P1	P2	P3	C1	C2	C3	C4
Schelde	Lippenbroek	Fresh	HB	3	3	3	0	0	2	0	2	3	0	1	1	3	0	0	0	3	2	2	2
Schelde	Groynes Waarde	Meso	B	2	1	1	0	0	1	0	1	1	1	1	1	0	0	0	0	1	1	1	1
Schelde	Ketenisse wetland	Meso	B	2	2	1	0	0	1	0	1	1	1	1	1	1	0	0	0	1	2	1	1
Schelde	Paddebeek wetland	Fresh	B	3	3	3	0	0	2	0	2	3	0	1	1	3	0	0	0	3	2	2	2
Schelde	Paardenschor wetland	Meso	B	3	3	2	0	0	2	0	2	2	2	2	1	0	0	0	0	3	3	2	2
Schelde	Heusden LO wetland	Fresh	B	3	3	3	0	0	2	0	2	3	0	1	1	3	0	0	0	3	2	2	2
Schelde	Sediment relocation Ketelplaat	Meso	H	1	1	0	1	0	0	1	0	0	0	0	0	0	0	1	0	0	1	1	1
Schelde	Walsoorden 2004	Meso	B	1	0	1	-1	0	1	-1	1	1	2	0	1	0	0	0	0	0	0	0	0
Schelde	Walsoorden 2006	Meso	B	0	0	1	-1	0	0	-3	1	0	1	0	0	0	-2	-3	1	0	0	0	0
Schelde	Sandbars 2010	Poly	B	1	0	1	-2	0	1	-3	2	1	3	0	1	0	-2	-3	1	0	0	0	0
Schelde	Fish pond	Meso	B	3	3	1	2	1	1	0	2	1	3	0	1	0	0	0	1	2	2	2	2
Weser	Tegeler Plate	Oligo	B	3	3	2	0	0	2	0	3	3	2	2	2	3	0	0	1	3	3	3	2
Weser	Shallow water area Rönnebecker Sand	Fresh	HB	3	3	3	1	0	2	1	2	2	0	1	1	2	0	1	0	2	2	2	2
Weser	Vorder- und Hinterwerder	Fresh	HB	3	3	2	1	0	1	1	1	2	0	0	1	1	1	1	0	2	2	2	2

First concept manual NC and ES (in Dutch)

Summary

► ES and NC are a convenient way to connect the ecological and economic system. ES can become a common language for communication for specialists from different fields

► The ES and NC approaches creates opportunities for taking into account all economic, environmental and social effects and integrating this data into management.

► ES will allow to track changes in the ecosystem, which are unavoidable during any human activity

► The relationship between the various ecosystem characteristics and the extent or value of ecosystem service benefits is not always known and there is a lack of sufficient data

Identify Possible Synergies (and challenges)

- Connecting to other research topics and discussions like sustainability (SDG) and operationalizing resilience

- Tools are ahead of the available data. Gap between the conceptualization and endorsement of ES and the actual use of ES-based approaches in natural resources management practices

- Lack of a governance system and legal regime for protection and improvement of ES on national and international level (WFD and BHD)

What would we would like to gain from today

- Sharing experiences on pilot projects (Interreg) and issues

- Learning to know the network and research going on and new shared research needs

- Discuss about monitoring and data availability (temporal and environmental scale)

- Future cooperation