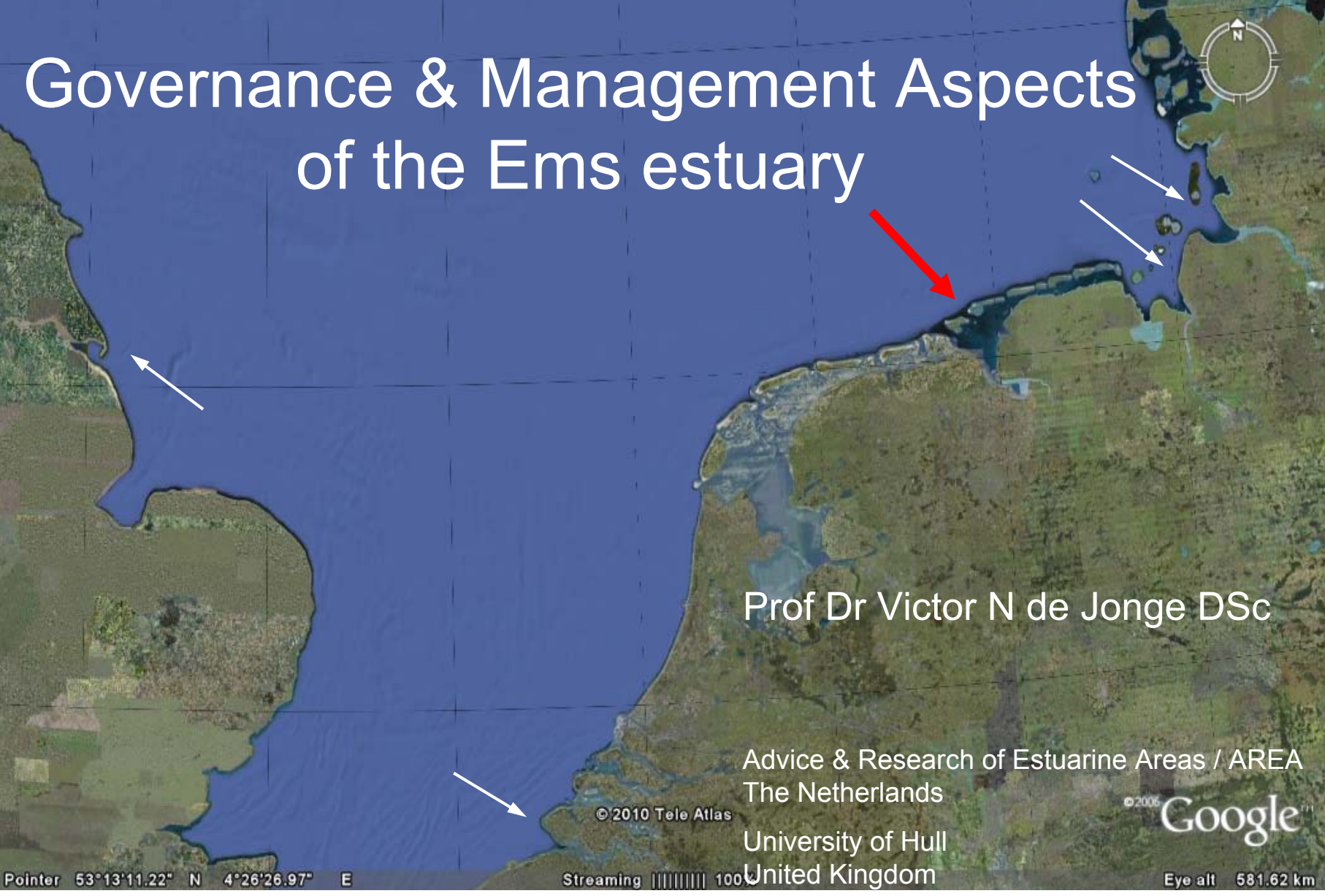
# Governance & Management Aspects of the Ems estuary




Prof Dr Victor N de Jonge DSc

Advice & Research of Estuarine Areas / AREA
The Netherlands

University of Hull
United Kingdom

Contribution to the EU INTERREG project TIDE

input to TIDE:
ecological and socio-economic complications in the Ems system

take home from TIDE:
knowledge beneficial to future development of the Ems region, the Ems estuary included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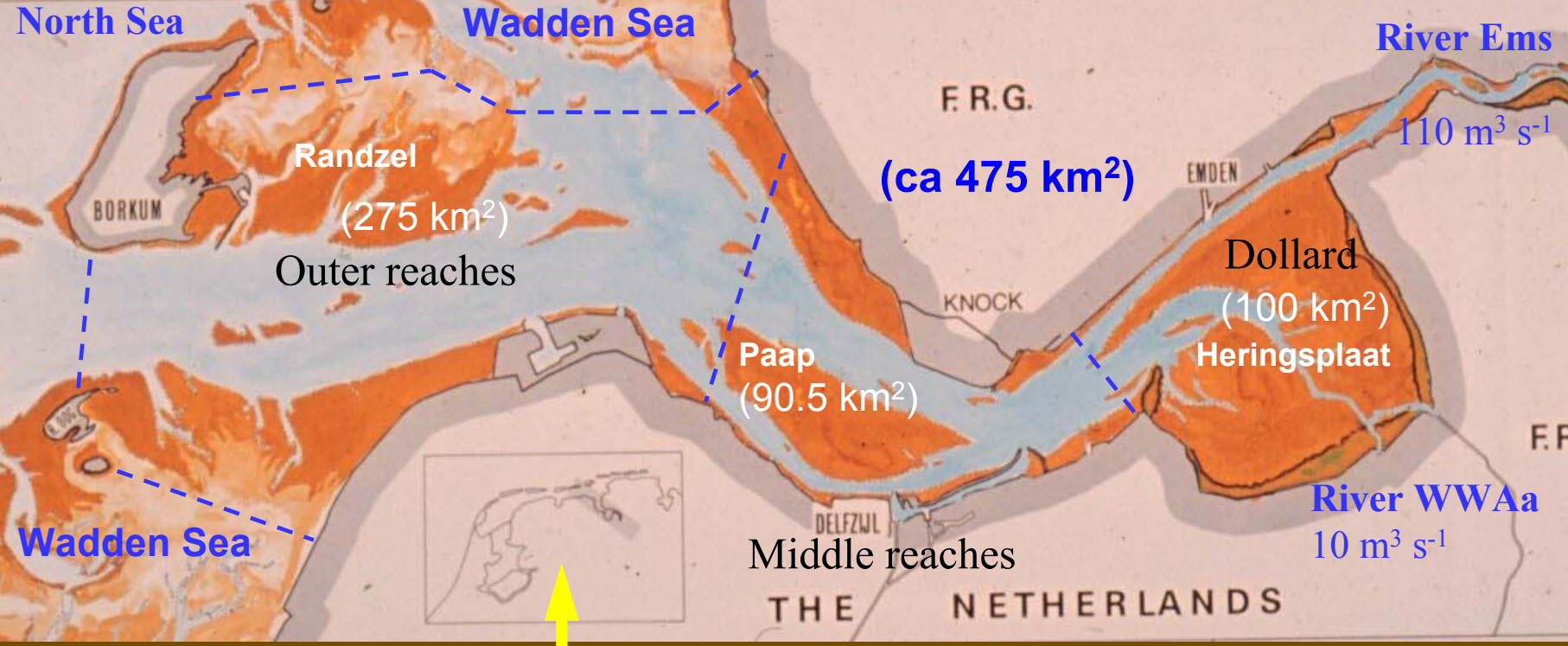
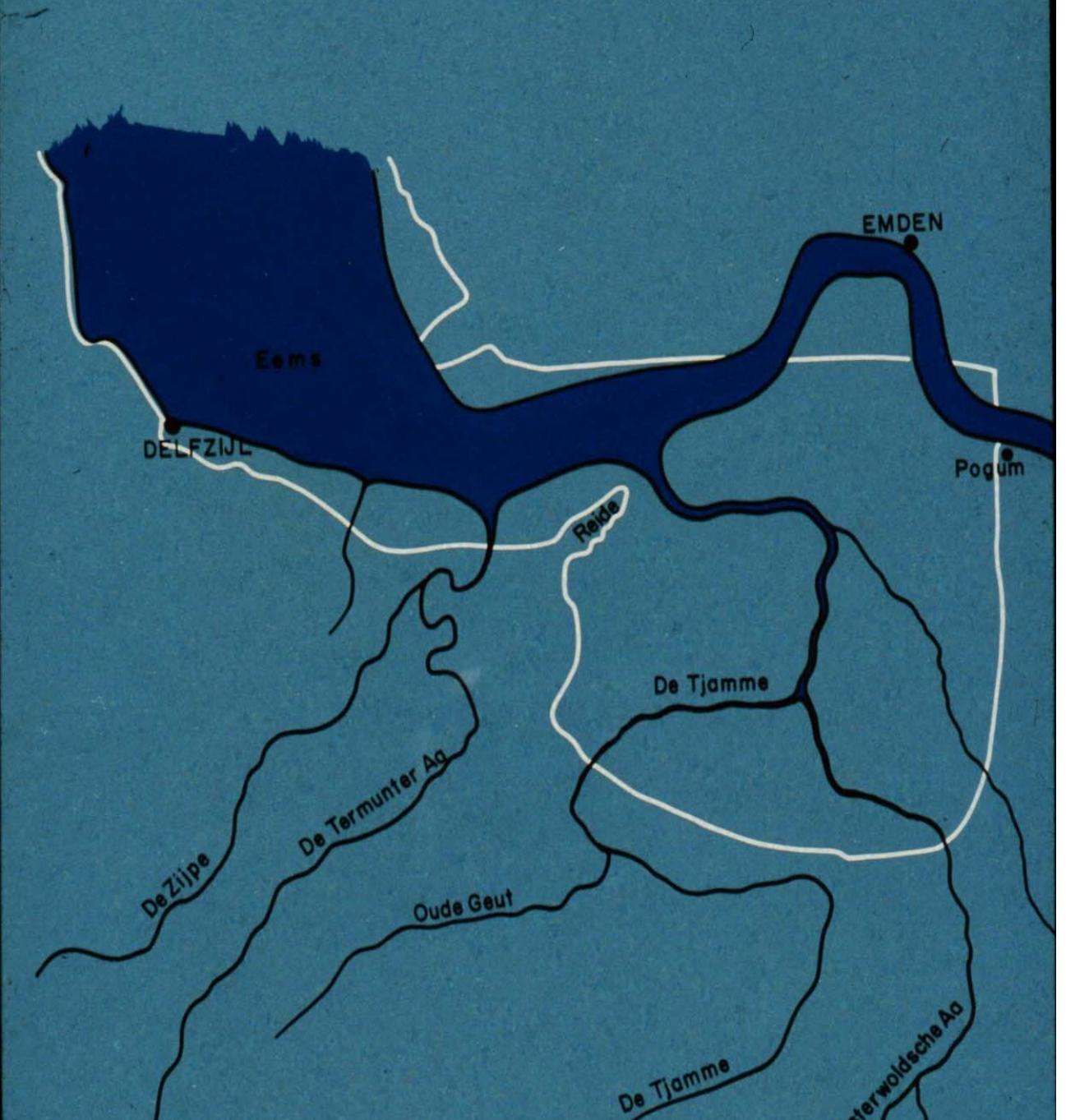


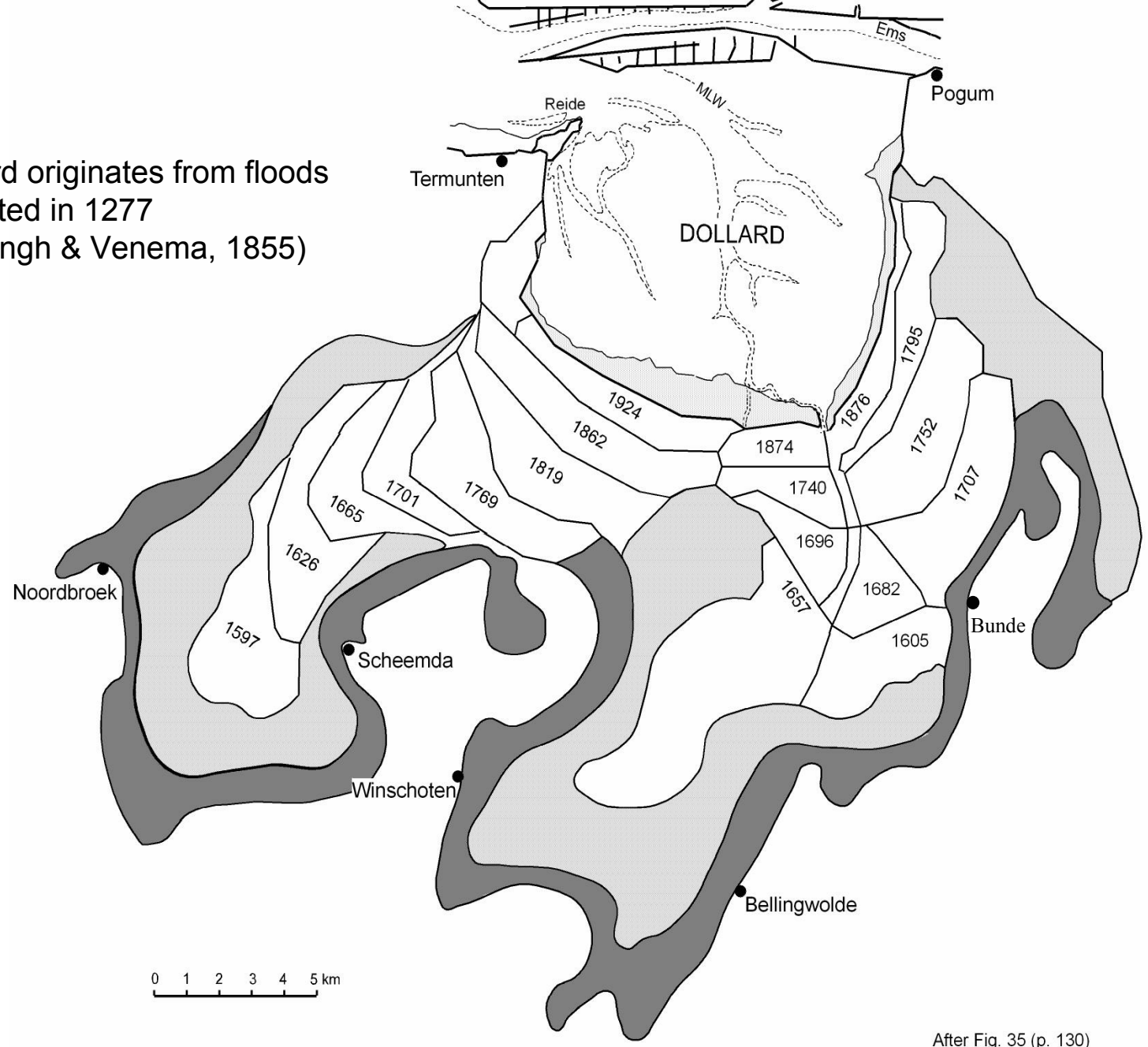

# The Ems estuary system




**Dark blue:**
**before 13th century**

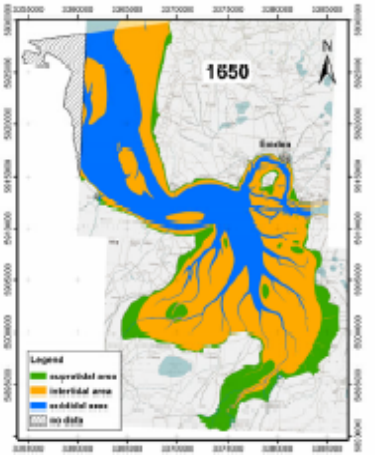
**White line:**
**present contours**

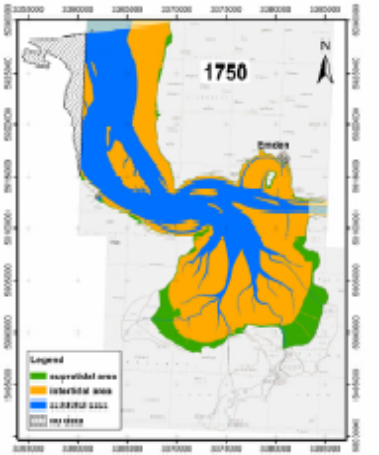
The Dollard originates from floods which started in 1277
(van Stratingh & Venema, 1855)

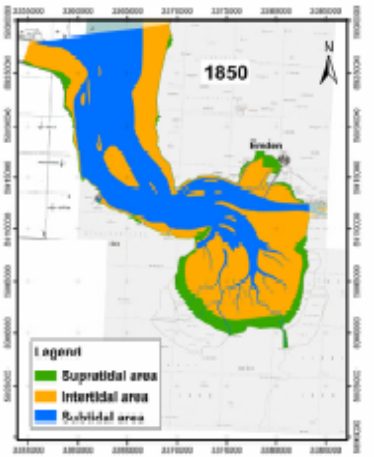


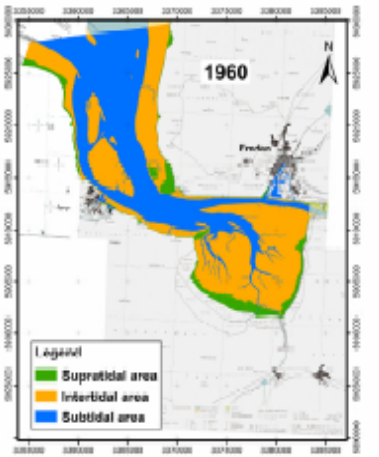

After Fig. 35 (p. 130)
in De Smet & Wiggers (1960)

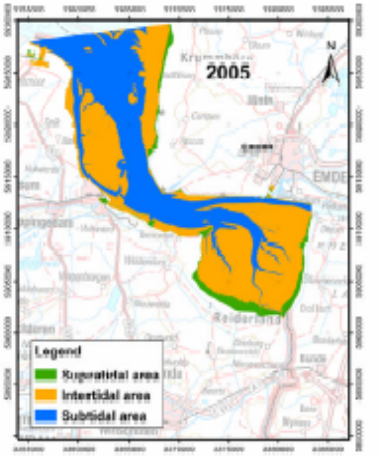
# Silting-up, land reclamation and morphodynamical post-adaption in the Dollard Bay




**Ems-Dollard 2005**

CONTENT

1. Problems
   - disputed border between The Netherlands and Germany
   - committees operating at a too low level (‘powerless’)
   - long term stagnating maritime related economy
   - deteriorated environment

2. Challenges
   - effective governance structure & policy making
   - restoration of the local landscape, river included
   - improvement of deteriorated environment
   - developing the entire cross border ‘Ems Region’


the border
old land
Stone border mark
in the Dollard
new land
since 13th century
old land
Delfzijl
Leer (Ostf
Slochteren
Scheemda
Menterwolde
Winschoten
Weener
Westoverledingen
Veendam
Papenburg
weir Herbrum
Vlagtw
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## Administrative developments after World War II

**08-04-1960 General Treaty on the Border between Germany and The Netherlands** and **executive treaties** as **Ems-Dollard Treaty 1960** (adapted in 1963) with:
Committee on maritime affairs: **"Ems Committee"**
At operational level director Rijkswaterstaat, directorate North Netherlands.
Additional tasks to maritime affairs were: Installations, pipe lines, extraction of gravel, clay and sand. **No environmental issues**.
Mentioned is co-operation in good neighbourhood (not effective enough).

**14-05-1962** Additional treaty regarding mining

**17-11-1975** Additional agreement on ship collisions

**20-03-1991** Agreement on co-operation between Niedersachsen & Groningen on environmental management and nature conservation issues (Hanze Regio)

**18-03-1992** Helsinki Treaty on the protection and use of transboundary water-courses and international lakes

**22-08-1996** Additional Protocol to the 1960 Ems Treaty. **Co-operation on water management and Nature Conservation issues under the PGC**.

**25-11-1996** Foundation of the EDR office for regional economic co-operation

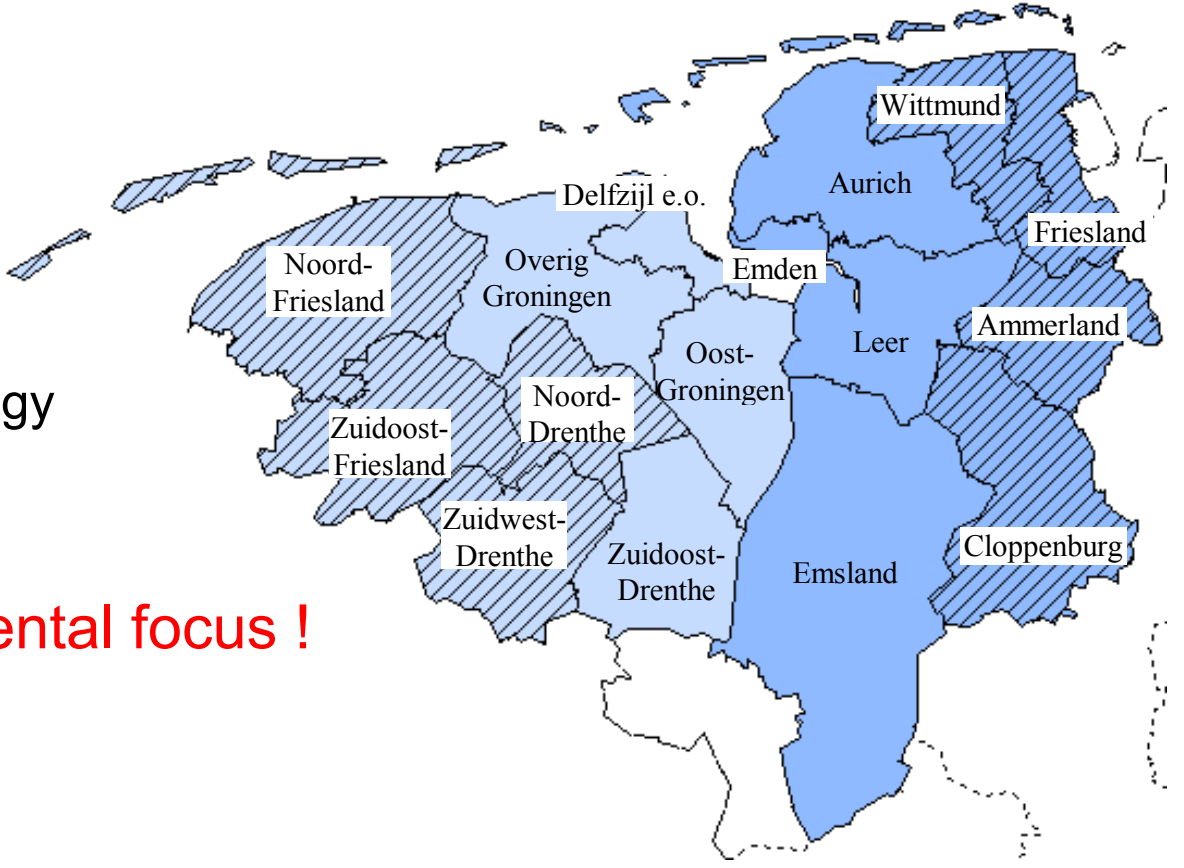
# International regional co-operation in the Ems-Dollard Region - EDR

EDR

## Focus

- Agro business
- Energy
- Maritime sector
- Sensor technology
- Tourism

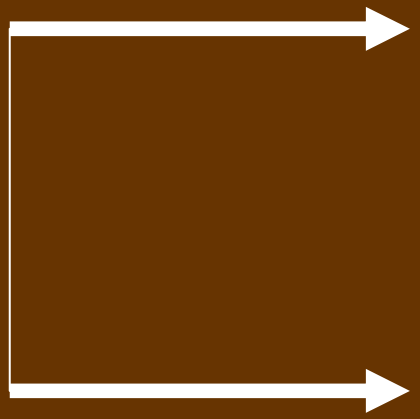
- No environmental focus !




The EDR office is independent but in practice usually follows initiatives by regional authorities (Province Groningen, Land Niedersachsen)

# Stresses to the Ems estuary

worst:
estuary & river



Changes in land use

Channel maintenance dredging

Harbour dredging
(disposal of harbour sludge included)

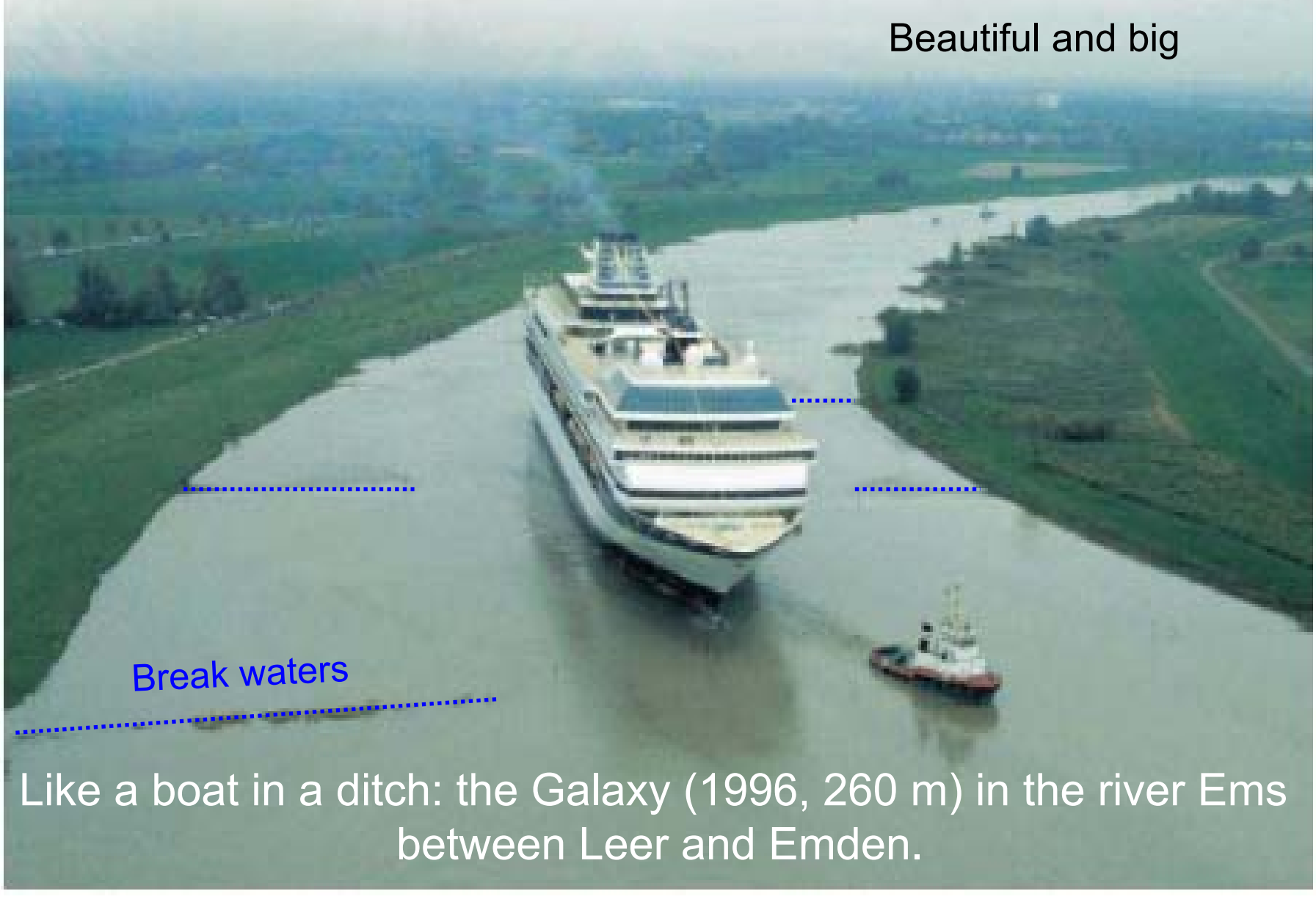
River deepening & canalisations

Phosphorous loads

Nitrogen loads

Climate change:
- Temperature increase
- Increase of precipitation
- Changed wind climate


In 2010 – 2012 two ships of 330 m each for Disney !




Like a boat in a ditch: the Galaxy (1996, 260 m) in the river Ems between Leer and Emden.

The ships for ‘Disney’ are 330 m in length and 37 m in width


Eemshaven departure 03 October 2007
NORWEGIAN GEM

Eemshaven departure 03 October 2007

River dredging & canalisations


‘Ems Sperrwerk’

# Is this all Proportional to the Benefits for Society & Nature ?

Jos Meyer Papenburg, 21 August 2007


when considering
the dramatic environmental consequences
River Ems:
the European ‘Yellow River’

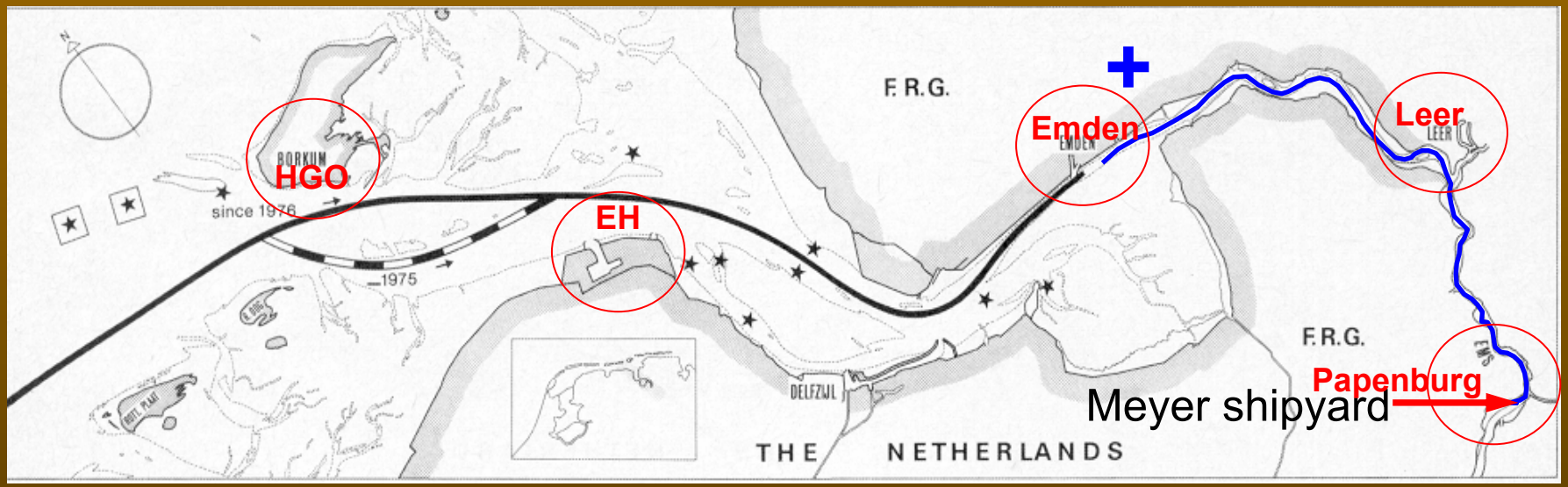
# Some data

| | |
|---|---|
| 1984/1985 | 5.7 m deepening pro Meyer-Werft (‘Homeric-deepening’) |
| 1991 | 6.3 m deepening pro Meyer-Werft (‘Zenith-deepening’) |
| 1993 | 6.8 m deepening pro Meyer-Werft |
| 1994/1995 | 7.3 m deepening pro Meyer-Werft (‘Oriana-deepening’) |
| 2001 | Ems water barrage (Ems Sperrwerk) – ready in 2002 |
| 2008 - | Required further adaptations of the river ! BUT …….. |

The system itself told us: no more, the limit has been reached

| | |
|---|---|
| 2009 | However, there are further plans for also a widening/ deepening Eemshaven – North Sea (The Netherlands) and a further deepening between Emden and Eemshaven (Germany) |

# The impact




*The problem is*
*much higher tides, amplified currents,*
*amplification of the gravitational circulation*
*and thus SPM and related hypoxia (anoxia)*

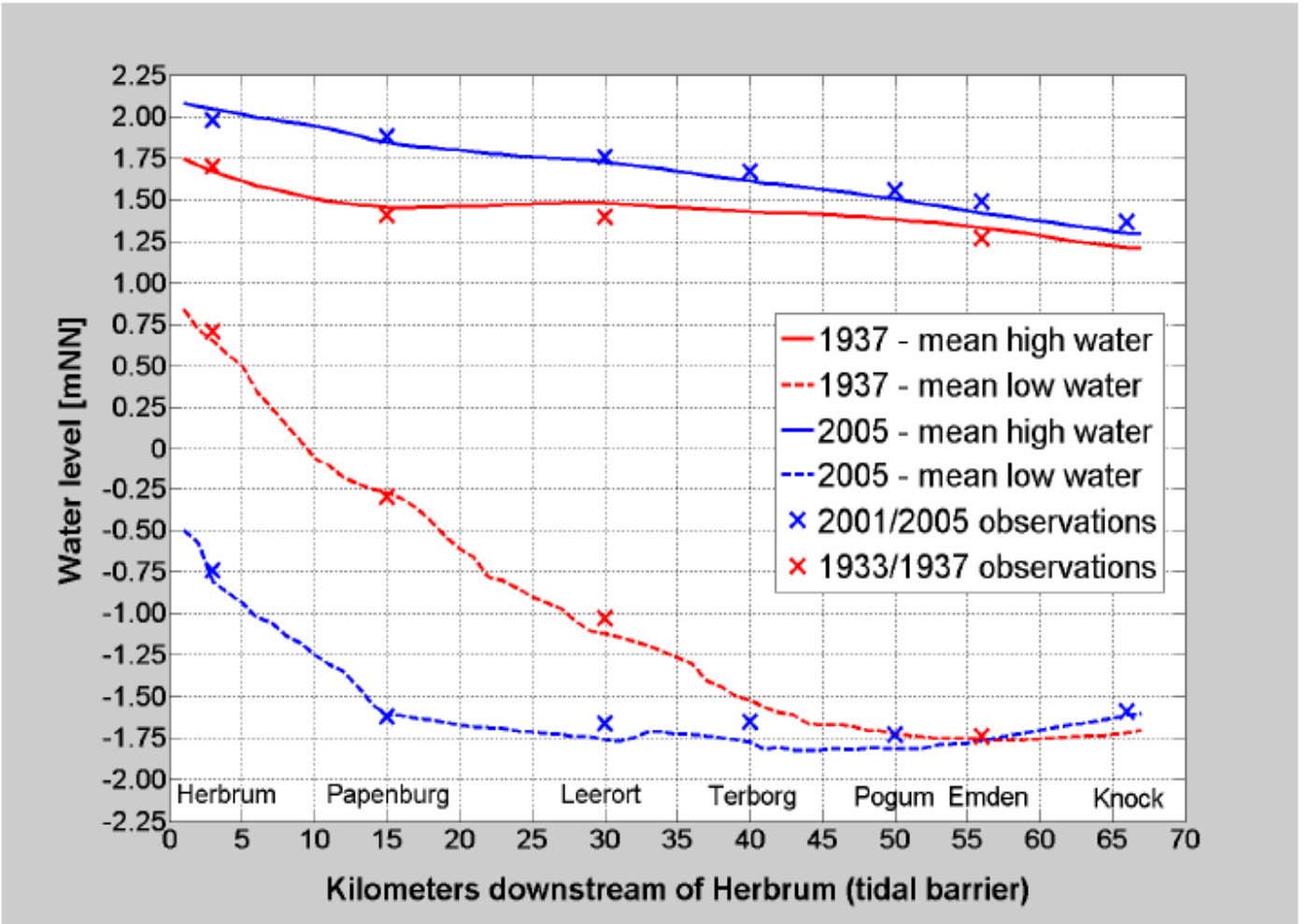
In this case there are 2 major but contrasting estuarine services:

1. Waterway function increasing human well being
2. Natural environment

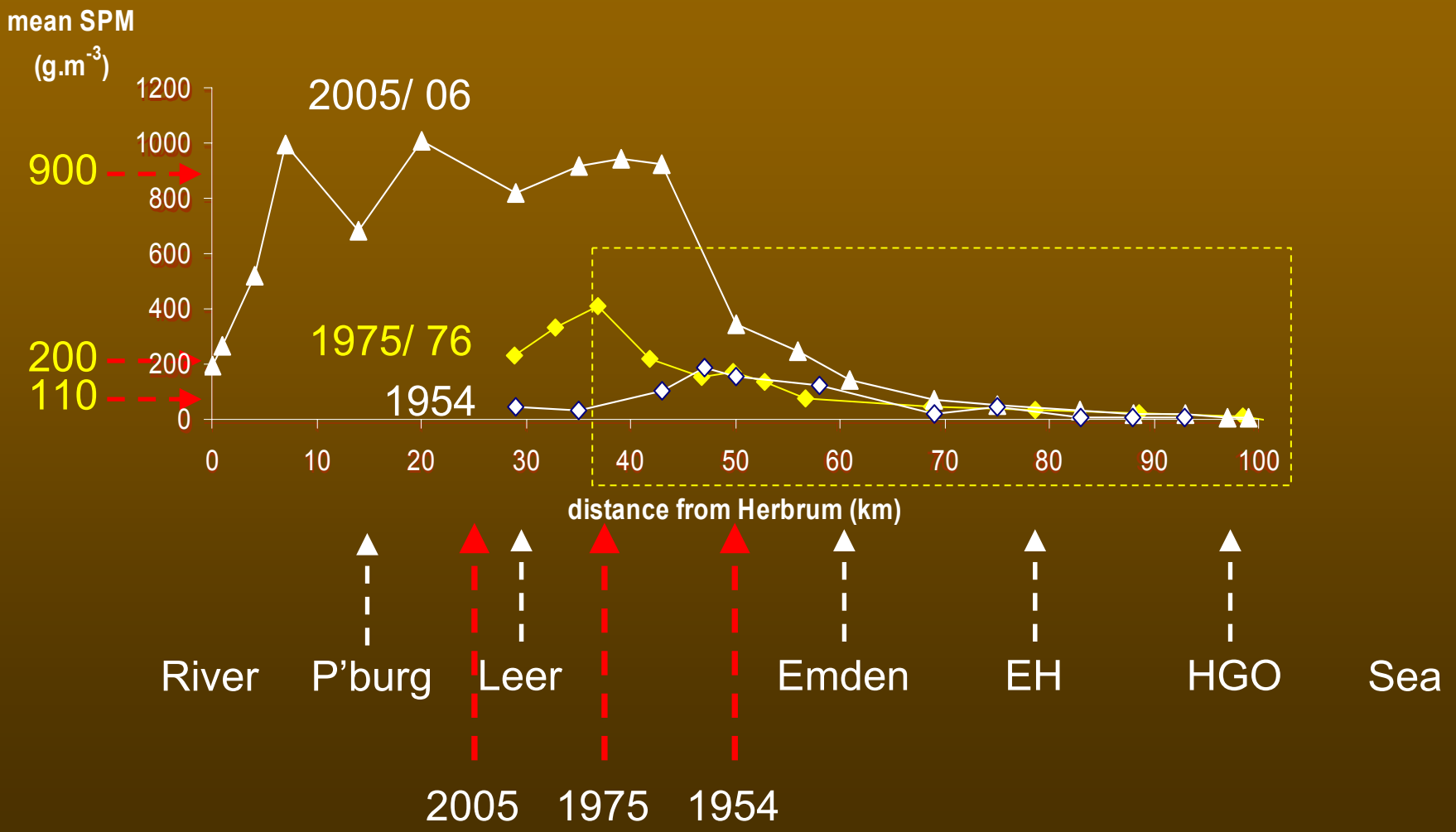
The transport function has been optimized !

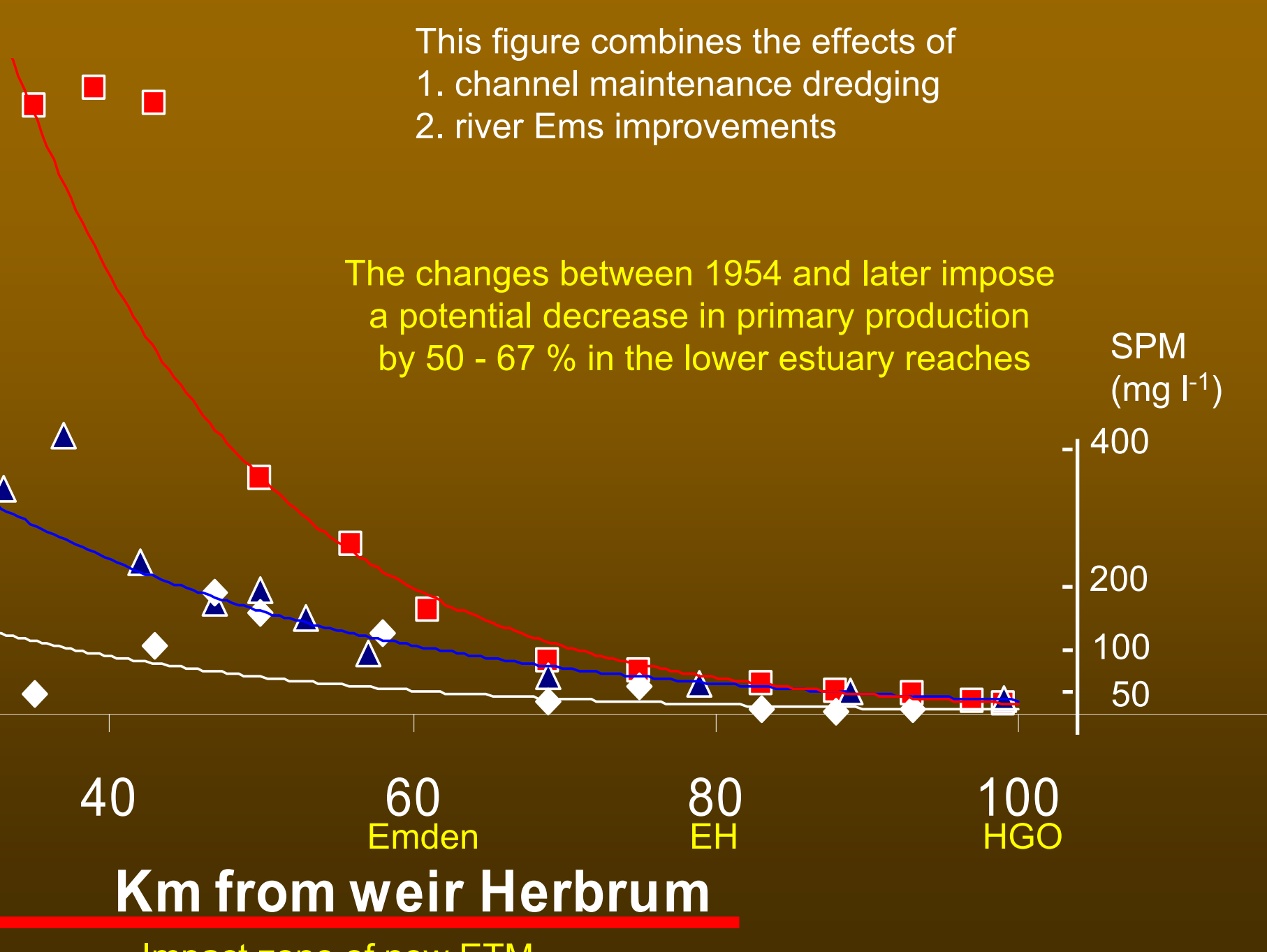
What about a healthy internal natural functioning of the ecosystem ?

# Mean High and Mean Low Water Levels - calculations versus observations

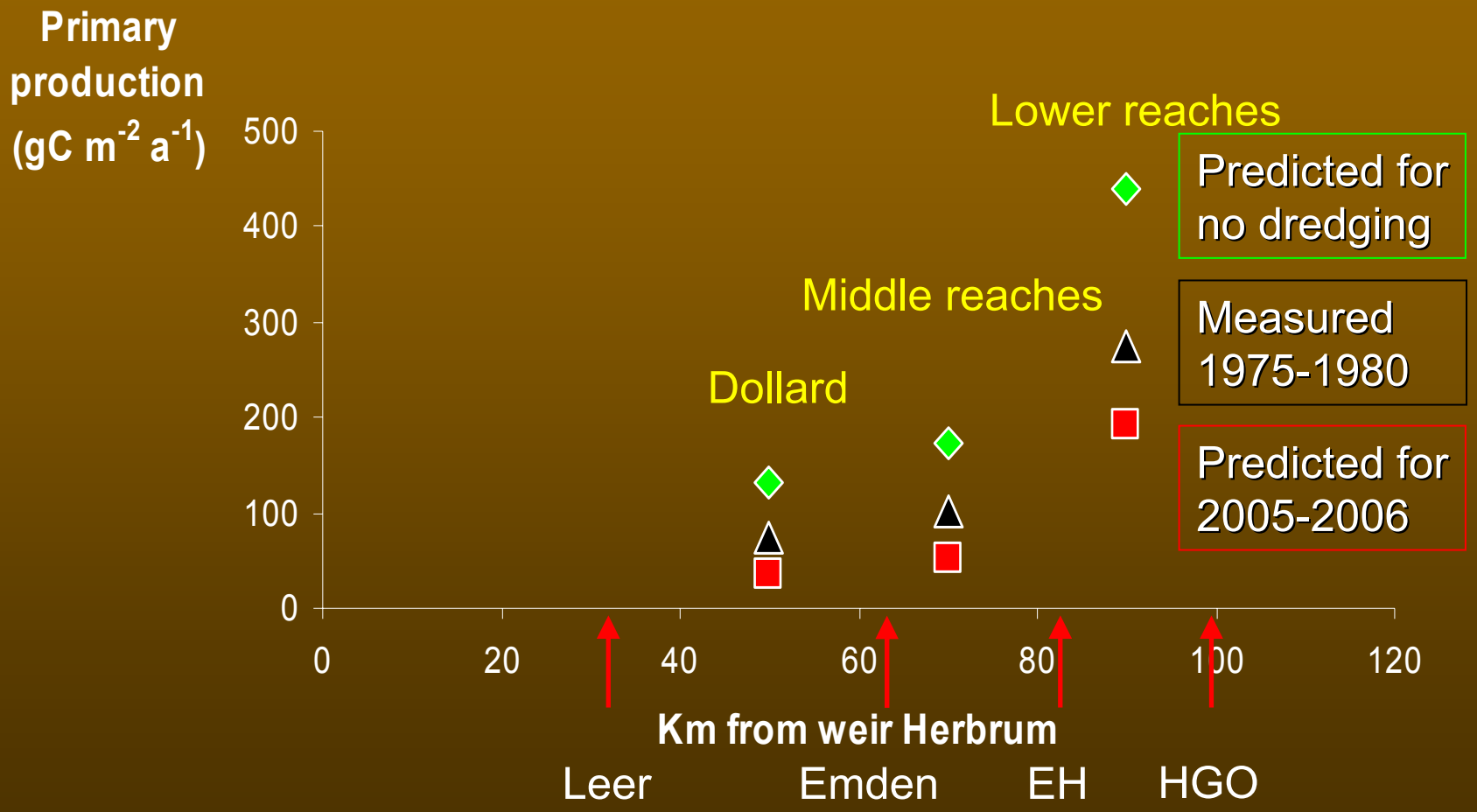


## mean suspended matter concentration in the Ems estuary

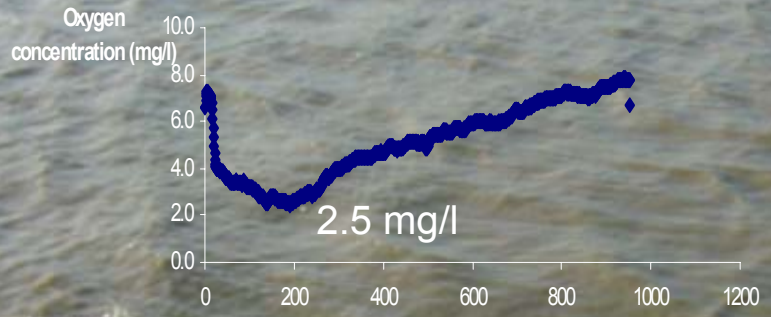


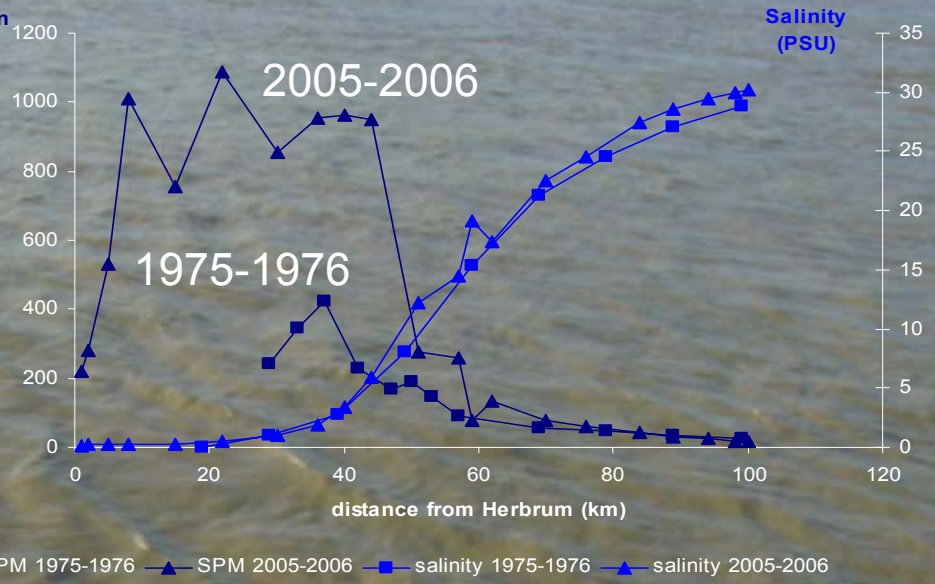

This figure combines the effects of
1. channel maintenance dredging
2. river Ems improvements
The changes between 1954 and later impose
a potential decrease in primary production
by 50 - 67 % in the lower estuary reaches
SPM
(mg l-1)
400
200
100
50
40
60
Emden
80
EH
100
HGO
Km from weir Herbrum

# River Ems not included in this figure



# The change in the SPM load (light climate) also affected $O_2$ ….



# Why could this all happen ?

# Estuary part

1. International committee under the 1960 border treaty functioning at a too low administrative level and charged to handle and decide upon ‘maritime affairs’ and not any environmental aspect
2. Weak regional economic climate in Germany and The Netherlands

# River part

Locally strong company with effective lobby network not willing to give up its position in Papenburg. According to the local population some ‘stimuli’ are:

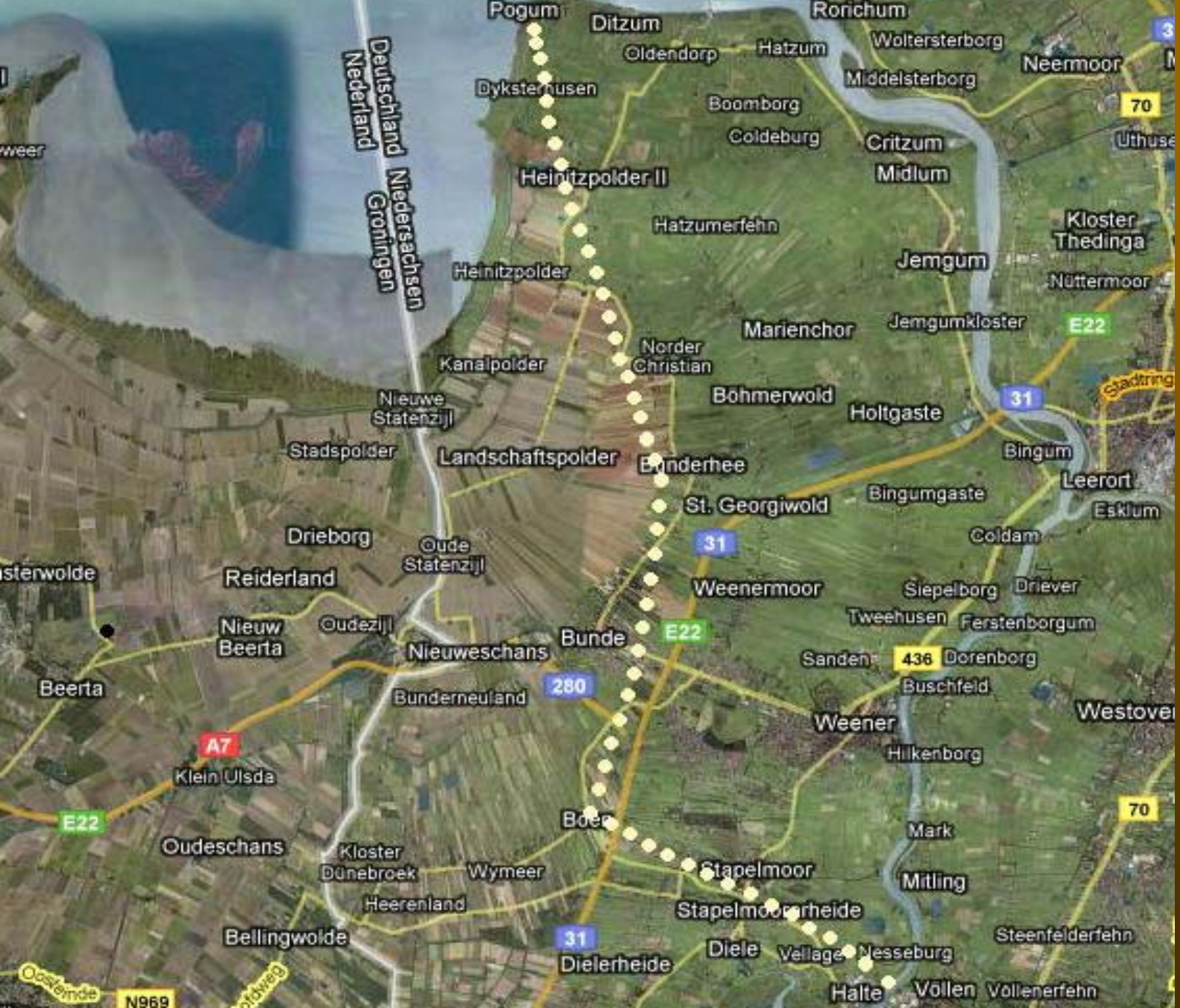
1. Papenburg: Christian democrats
   Emden: Socialists
2. Papenburg: Reliable relation with good suppliers
   Emden: Considered as less reliable
3. Papenburg: Historically strong political lobby
   Emden: No good lobby

# How to proceed along governance ?

1. Effective cross border ‘governance’
   (may be level of Minister of Foreign Affairs ?)

2. Preparing joint environmental action, by restoring the Ems drainage basin (several ideas available!)

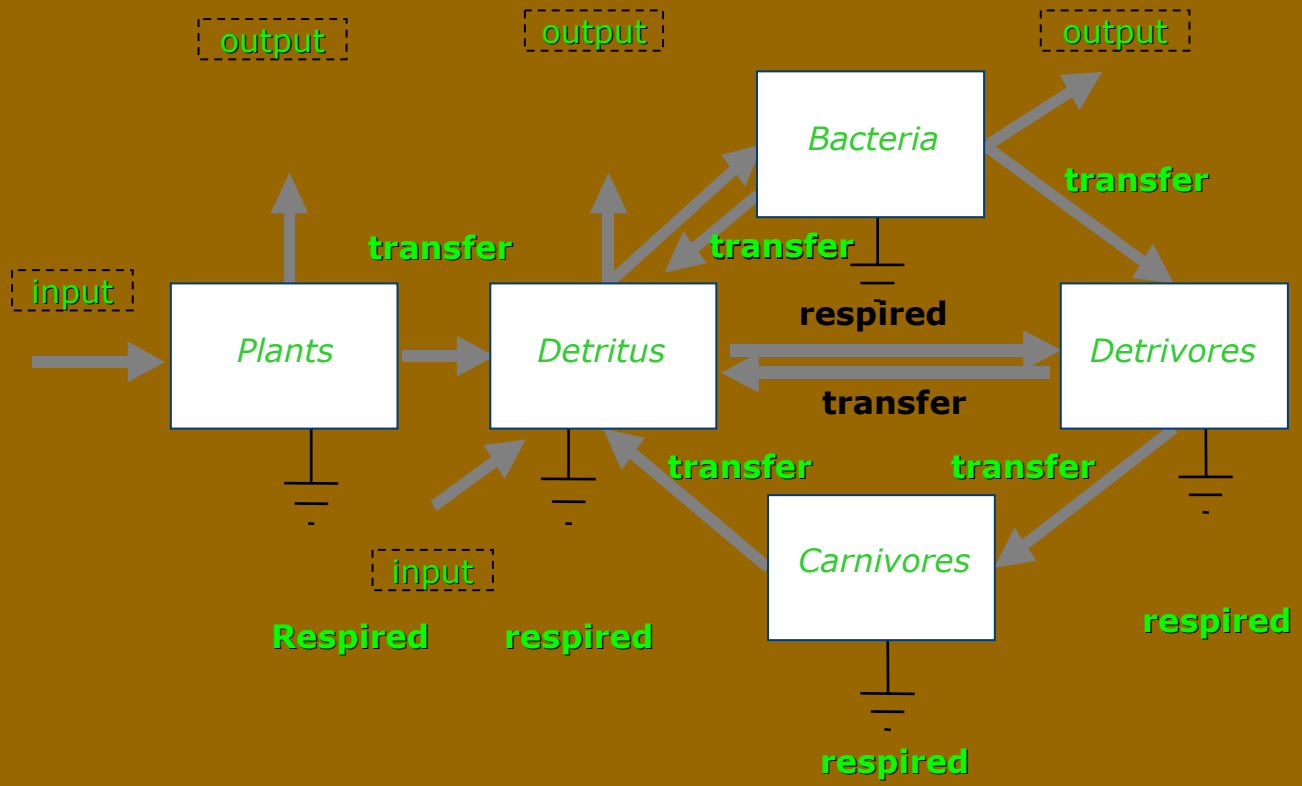
3. Preparing a cross border geographical restructuring of industrial, rural and leisure activities


Pogum
Ditzum
Ronichum
Oldendorp
Hatzum
Woltersterborg
Neermoor
Middelsterborg
Dykster husen
Boomborg
Coldeburg
Critzum
Midlum
Heinitzpolder II
Hatzumerfehn
Kloster Thedinga
Jemgum
Heinitzpolder
Nüttermoor
Marienchor
Jemgumkloster
Norder Christian
Kanalpolder
Nieuwe Statenzijl
Bohmerwold
Holtgaste
Stadtring
Stadspolder
Landschaftspolder
Bingum
Leerort
Bingumgaste
St. Georgiwold
Esklum
Coldam
Drieborg
Oude Statenzijl
Reiderland
Weenermoor
Siepelborg
Driever
Tweehusen
Ferstenborgum
Nieuw Beerta
Oudezijl
Nieuweschans
Bunde
Sanden
Dorenborg
Beerta
Bunderneuland
Buschfeld
Weener
Westover
Hilkenborg
Klein Ulsda
Mark
Oudeschans
Kloster Dünebroek
Wymeer
Stapelmoor
Mitling
Heerenland
Stapelmoorerheide
Bellingwolde
Steenfelderfehn
Diele
Vellage
Nesseburg
Dielerheide
Halte
Vollen
Vollenerfehn
Deutschland
Nederland
Niedersachsen
Groningen
E22
A7
280
436
70
31

# How to proceed technically ?

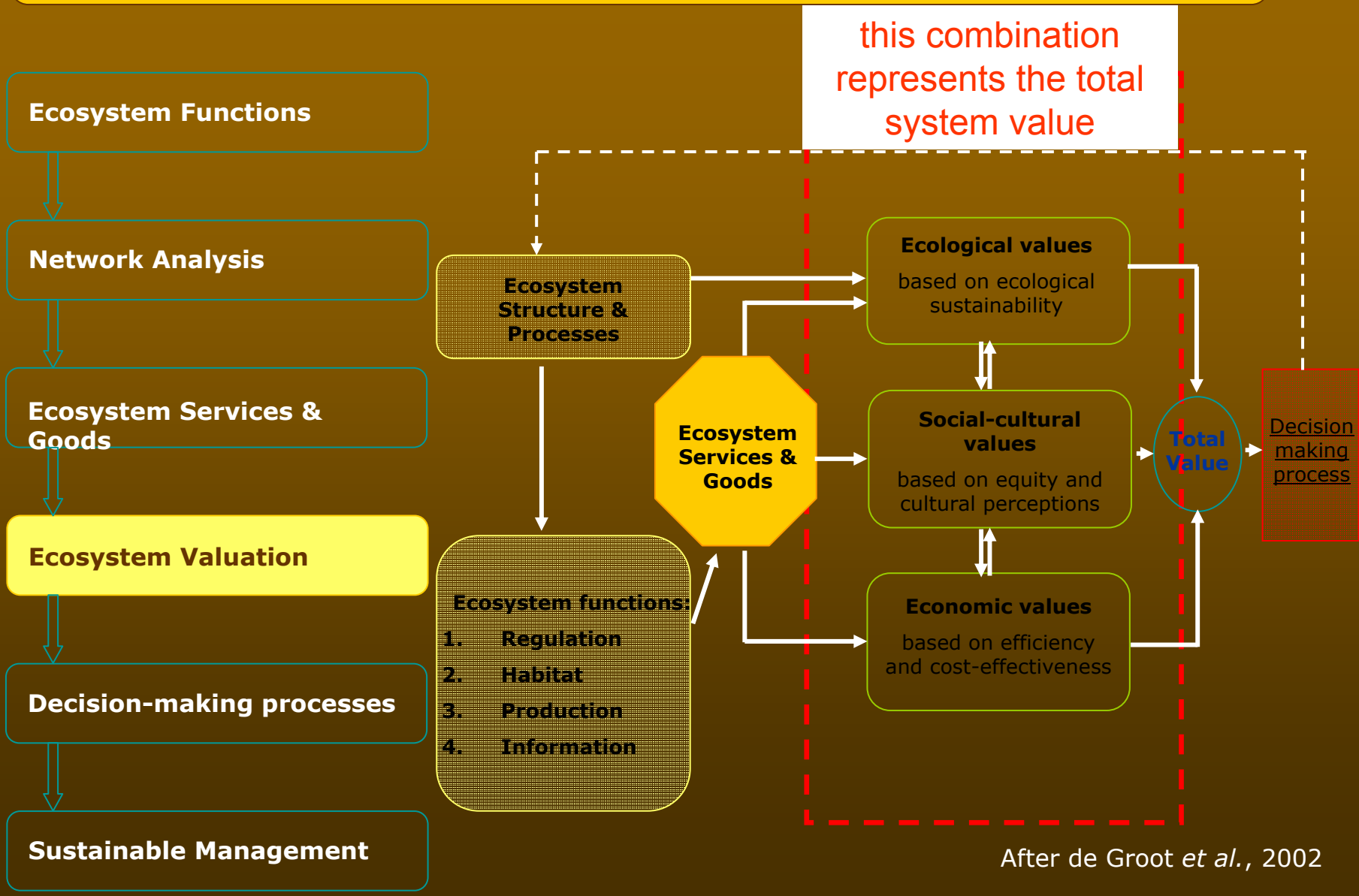
- Ecosystem approach
  (balancing economy and nature within the 'integral system')
  which ecologically may mean:

- DPSIR approach in combination with
- System flux analysis (of C, energy, P, N)
  (providing a number of system indicators)
- Calculation of direct and indirect costs and benefits of the pressure related economic, cultural and ecological functions of the system



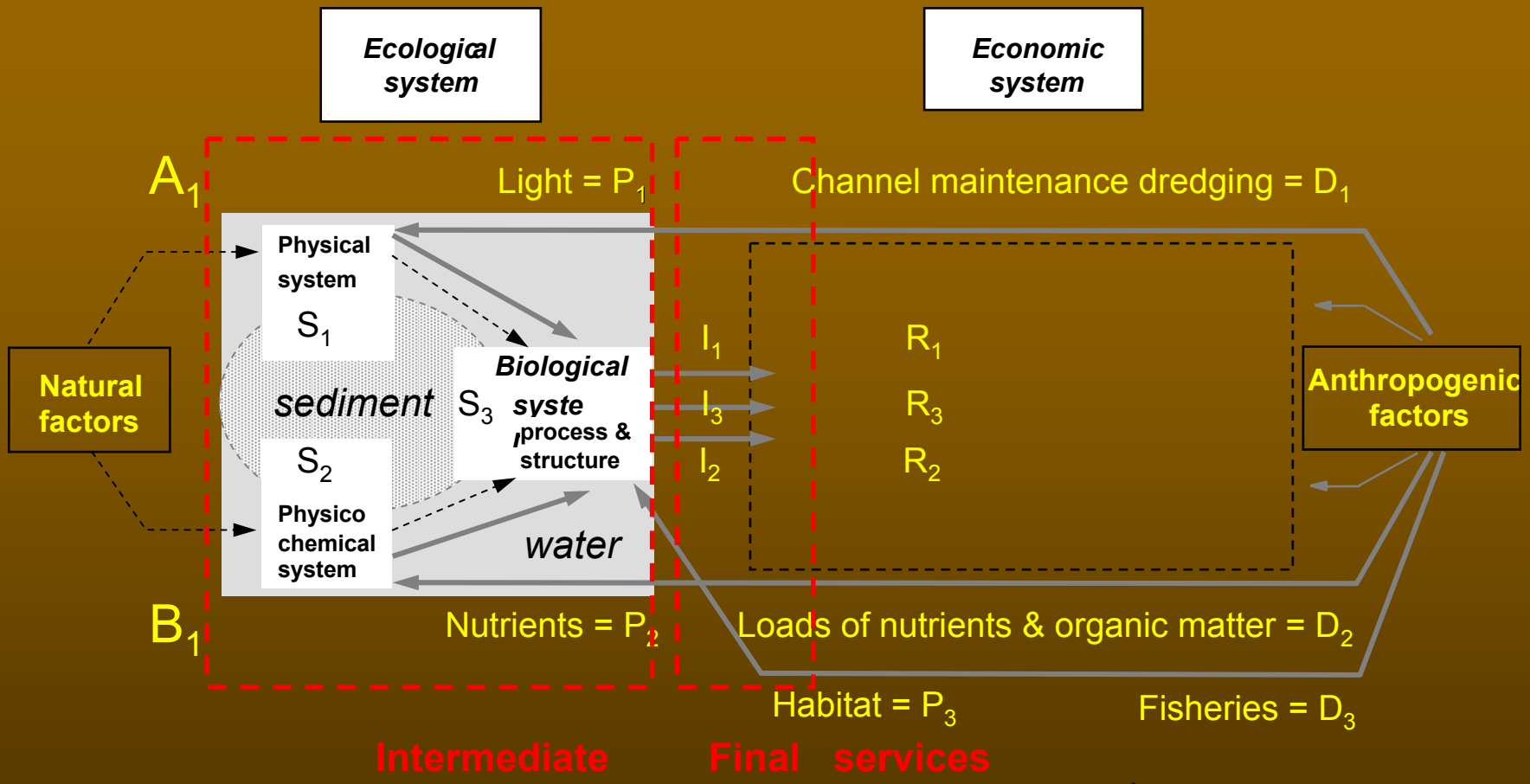

Flow diagram suitable for ‘Ecological Network Analysis’ which is a flux analysis also applicable to the societal part of the Integral System (slide below)

# The Integral System: how to apply it?




After de Groot *et al.*, 2002

# Integral system




**DPSIR approach:**

D = driver

P = pressure

S = state

I = impact to humans

R = supposed human response


ADVICE AND RESEARCH OF ESTUARINE AREAS

v.n.de.jonge@planet.nl

AREA, The Netherlands

University of Hull, United Kingdom