

The impact of the growing sandbar on the social and economical state of the eastern coast of Knokke- Heist

A case study

Location of the study area



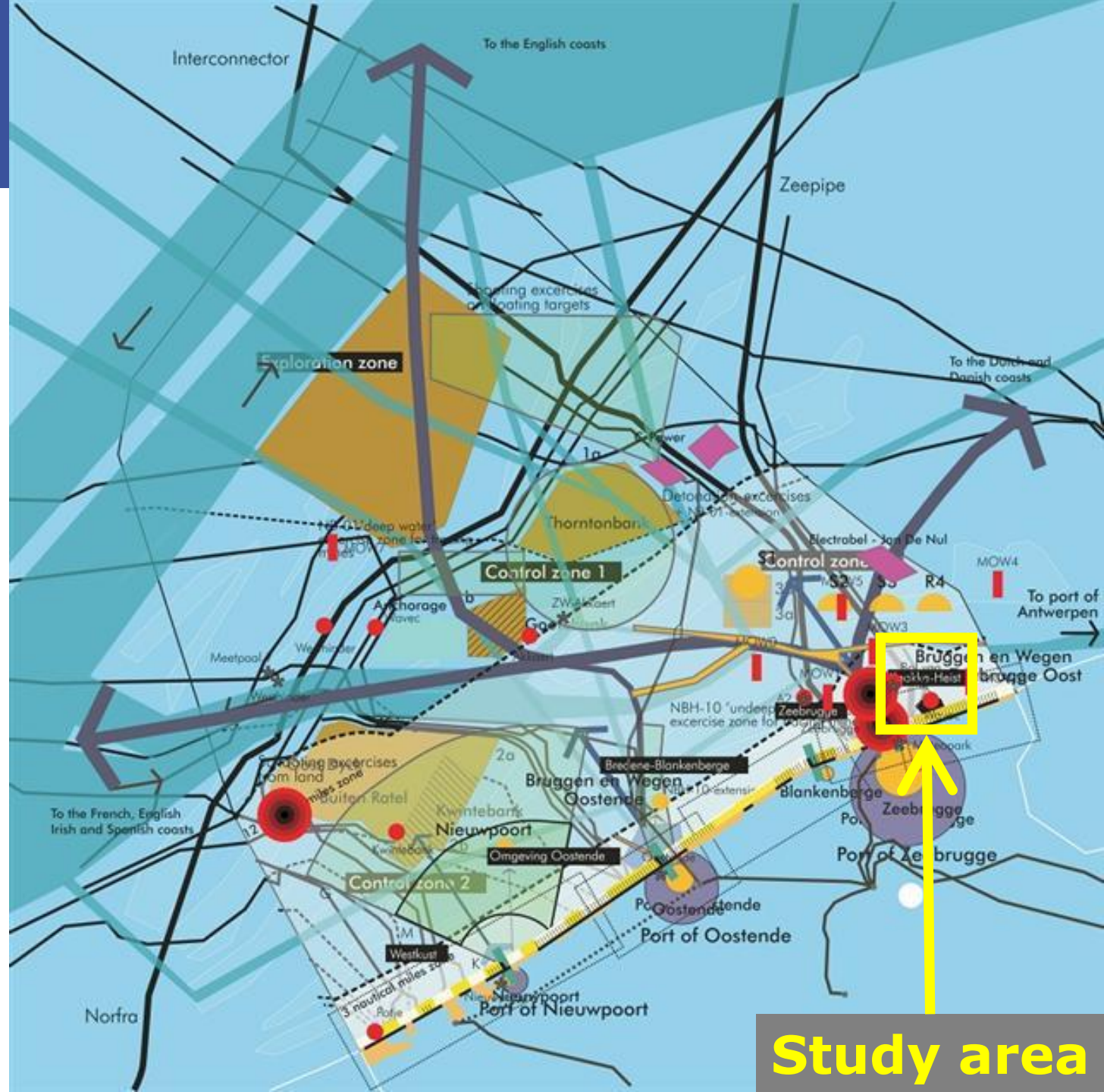
**Belgian part of
the North Sea
(BPNS)**



Belgian part of the North Sea

All types of uses:

- cables and pipelines
- sand and gravel extraction
- shipping
- fishing
- military use
- dredging
- dumping of dredge
- disposal
- coastal defence
- Wind mills
- survey and monitoring
- **tourism and recreation**
- **Sand bars**



Study area

OVERVIEW of the study

Terns refuge
in harbor

Marine
reserve

Special protection area 3
Bird directive
"Zeebrugge – Heist"

Fluxys LNG
terminal

Growing
sandbar

Port of
Zeebrugge

breakwater 51

SPA
Habitat directive
Dune areas (Zwin)

Protected
dunes

Nature reserve
"Baai van Heist"

RBSC Duinbergen
Sailing club

VVW Heist
Water sports centre



A growing sandbar: view

East air born view on sandbar (April 2008)

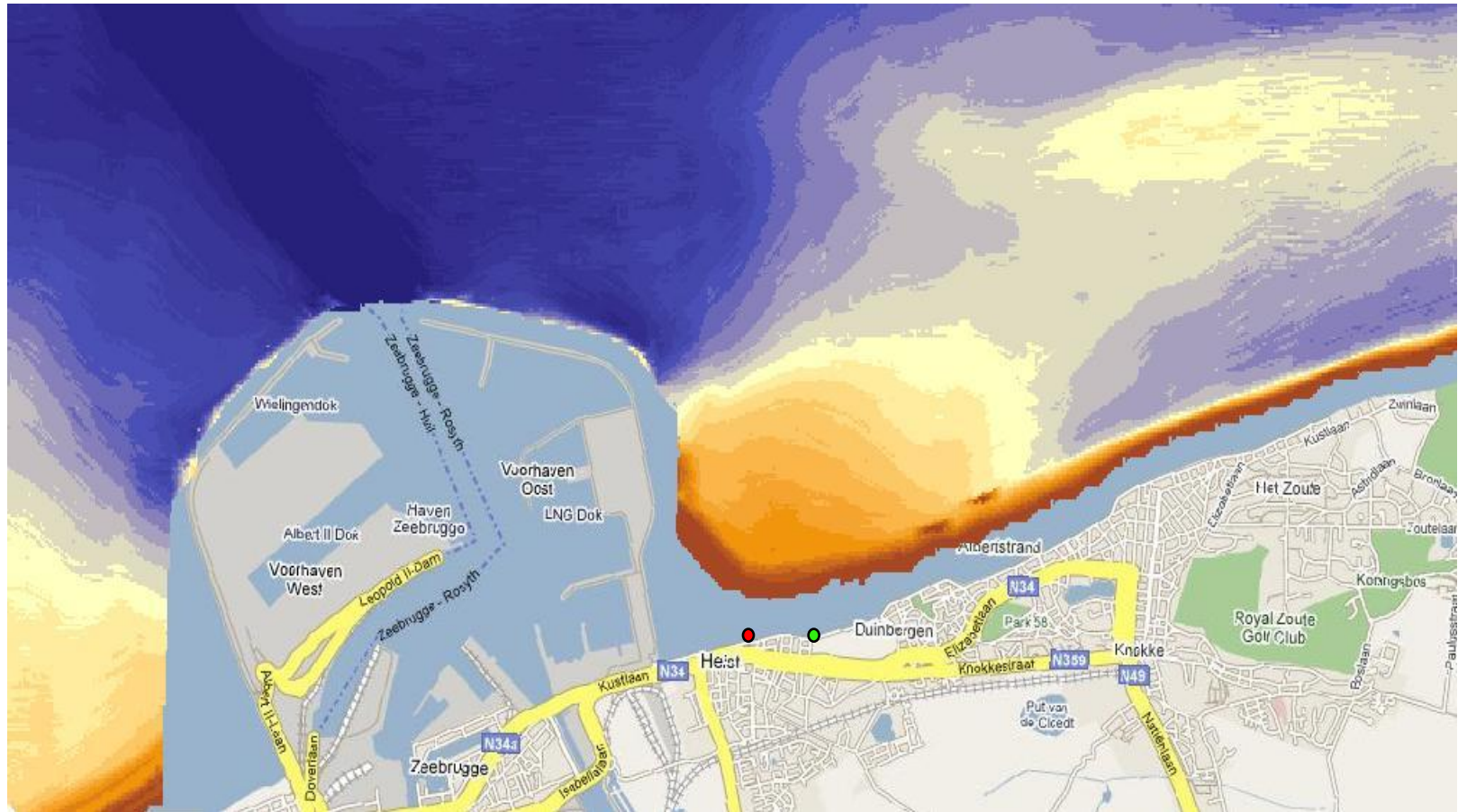


A growing sandbar: view

West view on sandbar (May 2008)



A growing sandbar: model



1970

1980

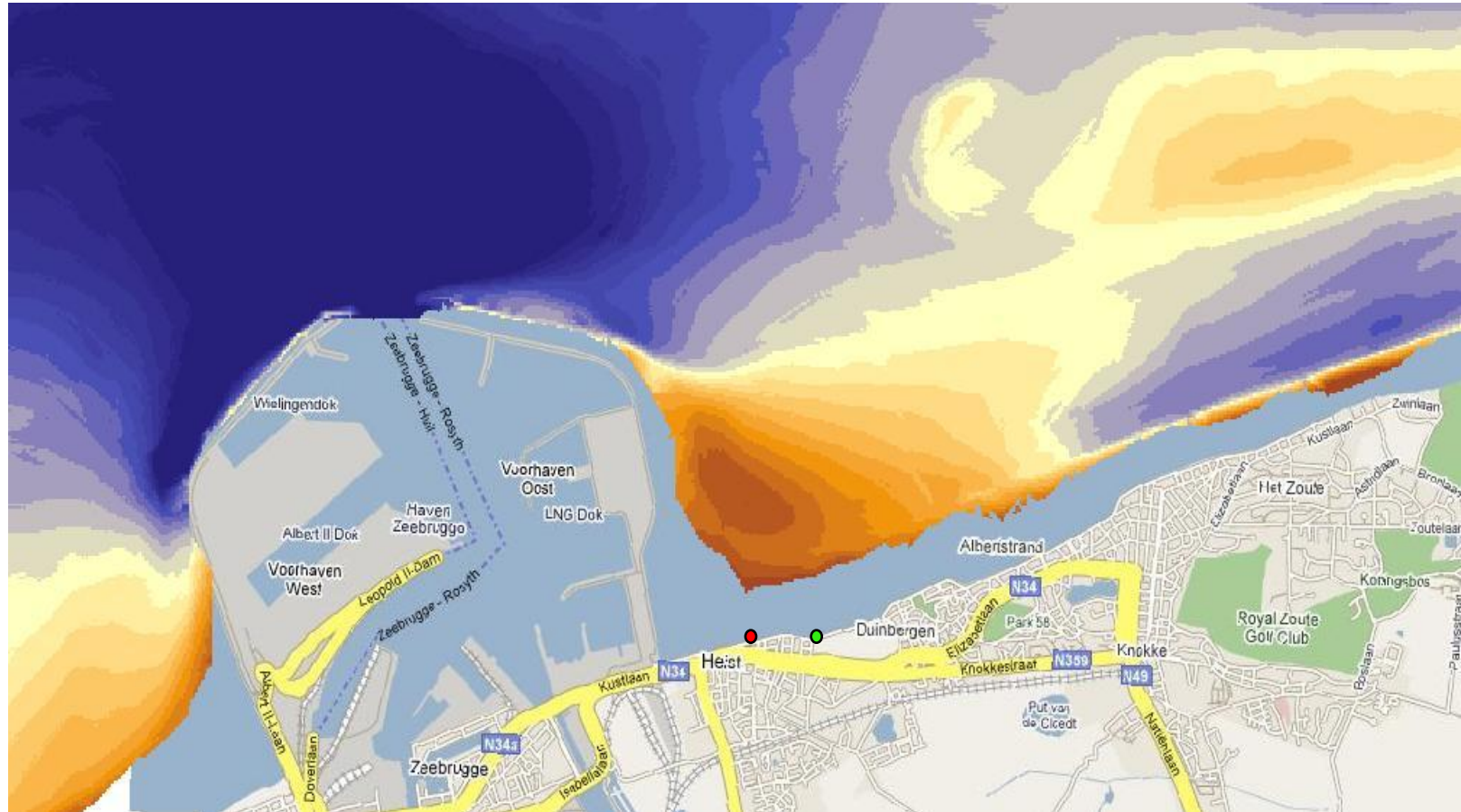
1990

2000

1987

Source: Rijkswaterstaat Zeeland

A growing sandbar: model



1970

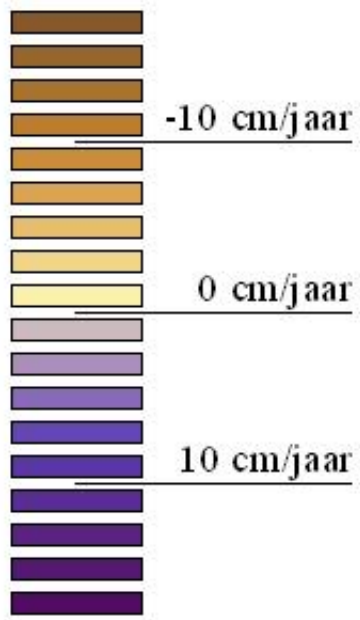
1980

1990

2000

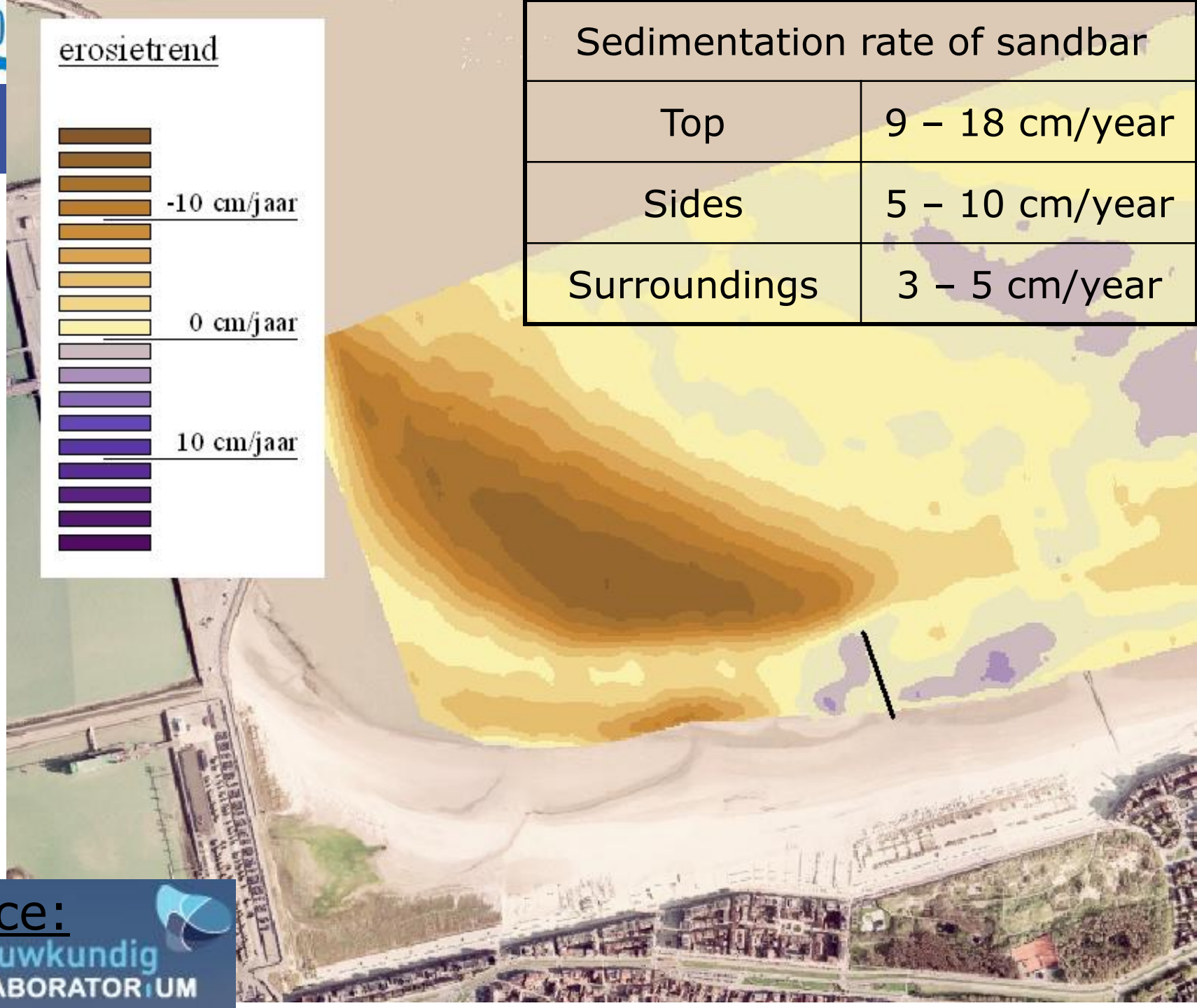
2003

erosietrend



Sedimentation rate of sandbar

Top	9 – 18 cm/year
Sides	5 – 10 cm/year
Surroundings	3 – 5 cm/year



A growing sandbar: prediction



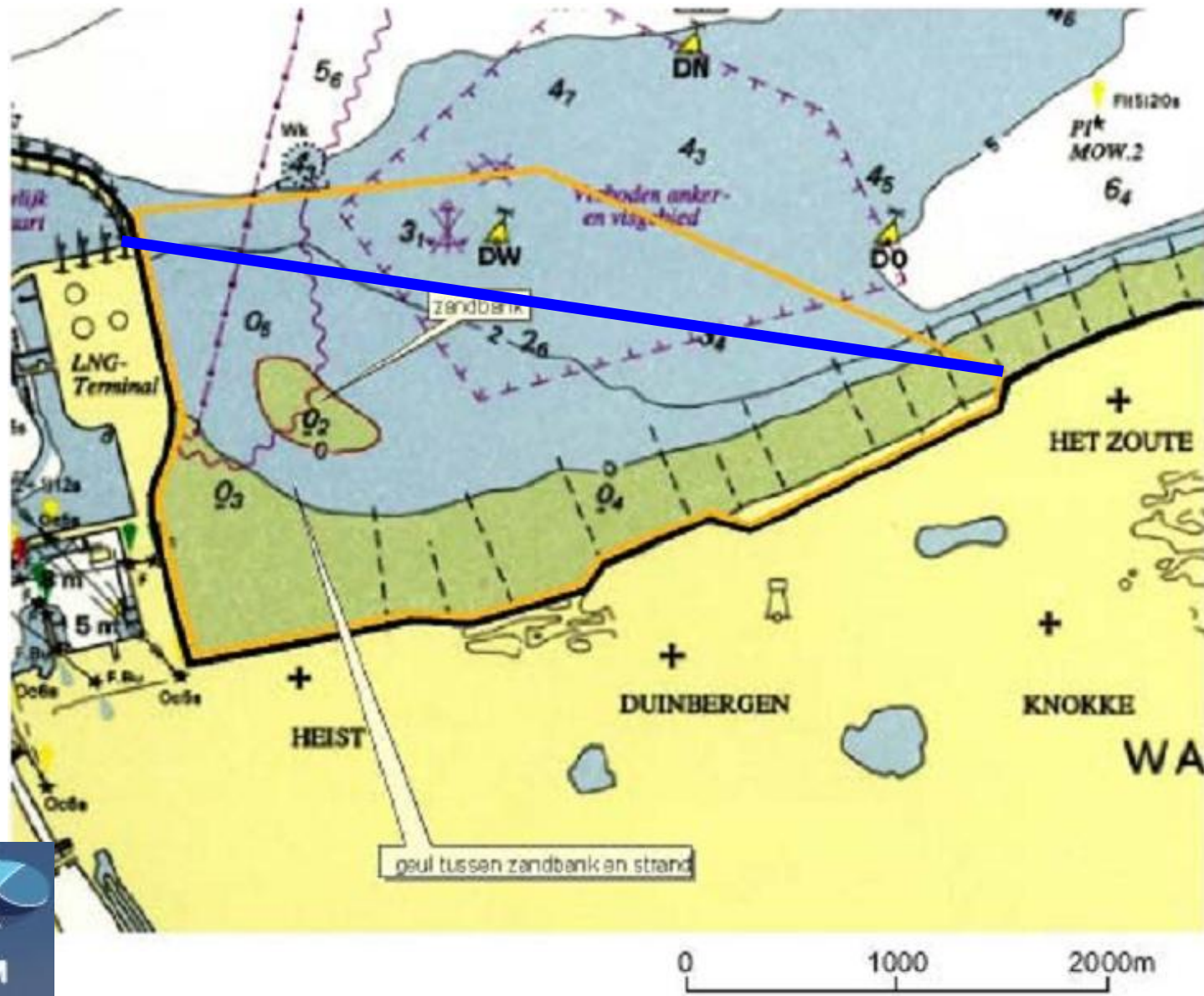
- Conclusion of morphological prediction
 - Based on extrapolation of observed morphological trends
- **Continuous sedimentation**
- **Rate of sedimentation during next years will not differ from observed rate of sedimentation during the past years**

A growing sandbar: prediction

Predicted shore line

Source:

waterbouwkundig
LABORATORIUM



A growing sandbar: juridical boundaries

Continental shelf

EEZ = exclusive economical area



12 miles

Territorial sea (Belgium)

A growing sandbar: juridical an overview

- **Europe**
 - Habitat & bird directive
- **Federal government**
 - Marine environment: all is forbidden, some exceptions
 - Marine reserve "Baai van Heist": **users agreement**
- **Flemish government**
 - maintenance of harbours + coastal care (monitoring, studies)
 - Planning of spatial arrangement: GRUP "Strand & Oostkust"
- **Regional government** (province West-Vlaanderen)
 - Planning of regional spatial arrangement: PRUP "Strand & Dijk"
- **Community** (Knokke-Heist)
 - local spatial planning and policy

Different governments

→ **different powers of authorisation**

→ **COMPLEX SITUATION**

A growing sandbar: current consequences



- Unsafe situation

- Upcoming tide can surprise people, “visiting” the sandbar
 - ditch between the beach and sandbar
- (kite) surfers are obliged to move to the east, but are confronted with the next breakwater (breakwater no. 51)
- Submerged sand bar (when high tide) can obstruct rescue operations

A growing sandbar: future consequences



- Social-economical

- Enlarged beach

- Larger distance between dike and sea
- 2 km wet beach (intertidal zone)
- Less attractive for visitors, tourists

- Sandbar

- Activities, starting at the current location of the water sports centre VVW Heist are impossible
- the next water sports centre Royal Belgian Sailing Club Duinbergen (2km eastward) will be obstructed in the future

- Negative impact on economical situation

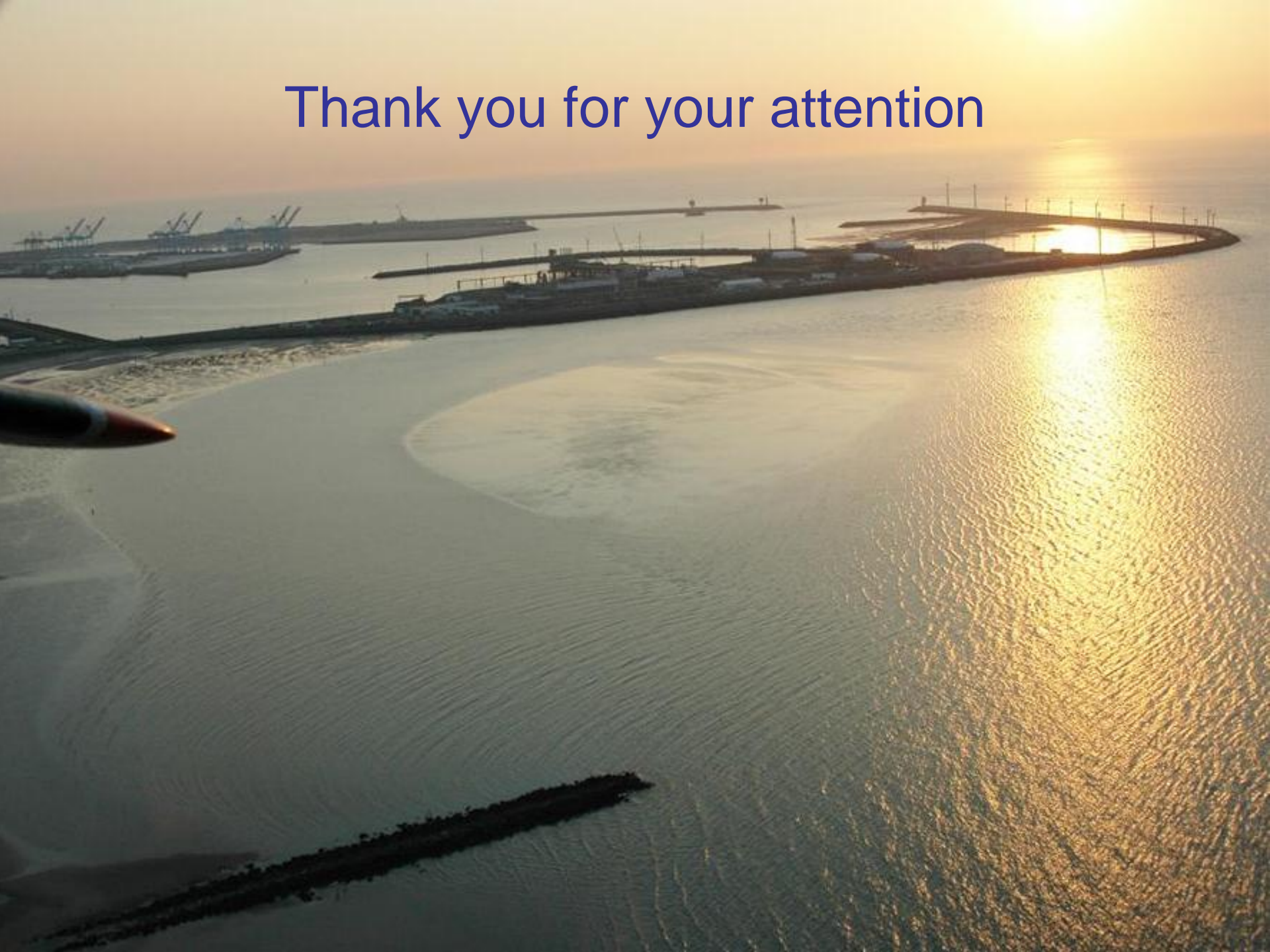
Solutions

- Dredging of the sandbar
 - 4M Euro + 1M each year
- Construction of an additional dam in sea
 - This will only shift the problem of sedimentation
- Closing of dumping sites nearby Knokke-Heist?
 - Federal government
- Let things the way they are (toward large beach)
 - New refuge for terns
 - Construction of buildings (catering industry)
 - Change or addition to current spatial planning
 - **Study of social and economical impact**
 - **Long term vision**

Study

- Social-economical analysis
- Multifunctional use
 - Different sectors and people
- Results in a new or change of spatial plan
- **A study as part of the C-scope project**

Thank you for your attention



Extra slides

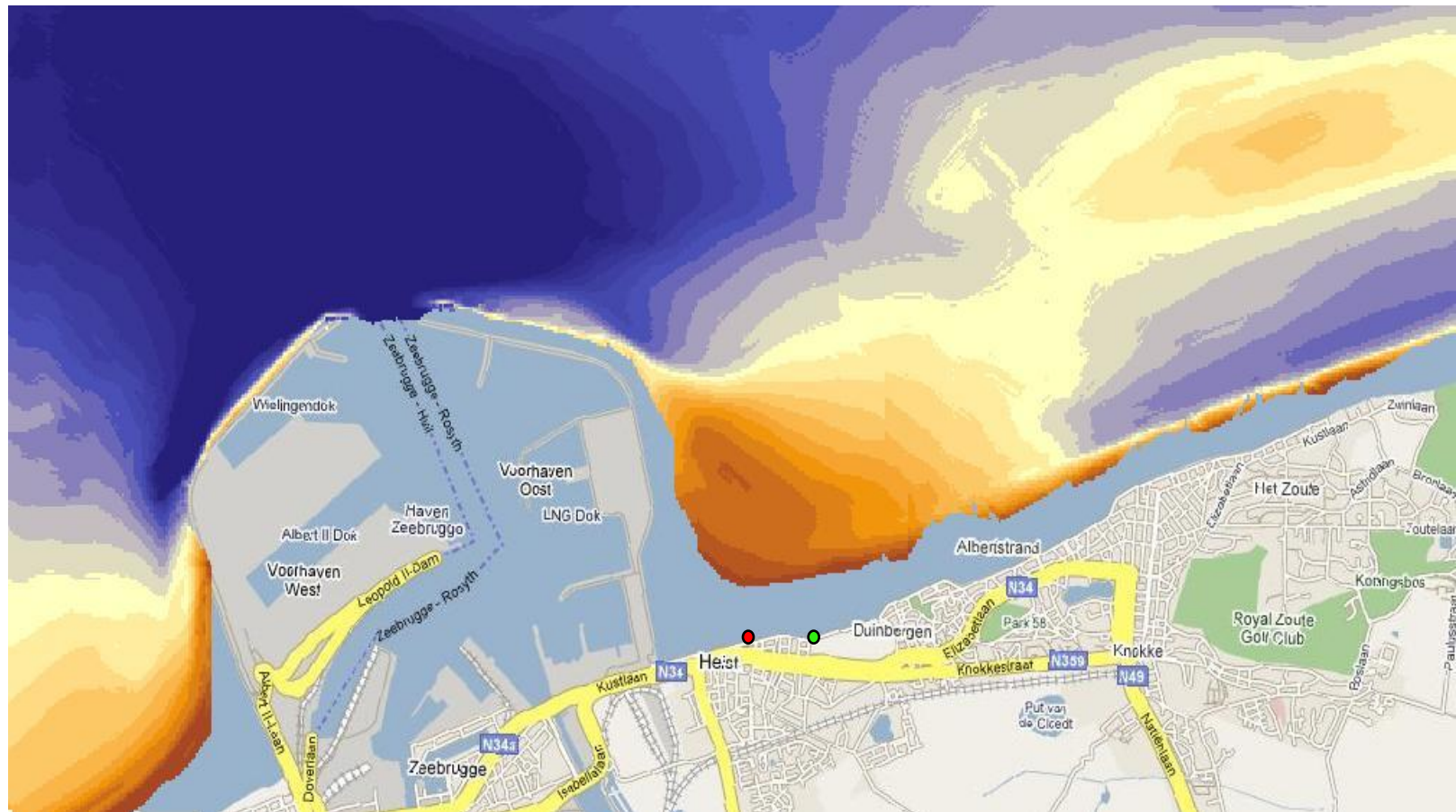
- Extra information

A growing sandbar

East air born view on sandbar



A growing sandbar



1970

1980

1990

2000

1999

Source: Rijkswaterstaat Zeeland

- **Europe**

- Special protection areas (Habitat & bird directive, SPA3)
 - Forbidden: civilian buildings, industrial activities, dumping
 - evaluation of possible effects on environment



- **Federal government**

- Marine environment: all is forbidden, except
 - Civilian buildings, ditching, rise of sea bed
 - with licence and evaluation of possible effects on environment
 - Dredging for maintenance
 - Authorization for dumping of natural material
 - Monitoring, scientific activities
 - Commercial fishing and shipping
 - Military without damaging or disturbing the environment
- Marine reserve "Baai van Heist": all is forbidden, except
 - With evaluation of possible effects on environment
 - Ditching, rise of sea bed, cables
 - **Users agreement**

- **Federal government**

- Marine reserve "Baai van Heist": **users agreement**
 - 5 different clubs/associations
 - Including "Water sports centre Heist"
 - Permission for water sport without propulsion
 - Permission for rescue operations
 - integration of different types of use in legal policy
 - enhancing social basis

- **Flemish government**
 - North Sea: maintenance of channels of harbours
 - Coastal protection (monitoring, studies, maintenance)
 - Planning of spatial arrangement
 - GRUP "Strand & Oostkust"
- **Regional government** (West-Vlaanderen)
 - Planning of spatial arrangement
 - PRUP "Strand & Dijk"
- **Community** (Knokke-Heist)
 - local spatial planning and policy