



Rijkswaterstaat

Ministerie van Infrastructuur en Waterstaat

All Clear (if time allows)

*Nature compensation
Spanjaards Duin in relation to
Rotterdam port extension*

Mennobart van Eerden

Dank: Bert van der Valk, Frank van der Meulen, Bas Arens, Kees Vertegaal, Wouter Beekman, Ronald Goderie, Maarten van der Valk, Arjan v.d. Heuvel, Marjon Paas, Audrey van Mastrigt, Arjan Hensen, Sef van den Elshout, Aldo Bouman

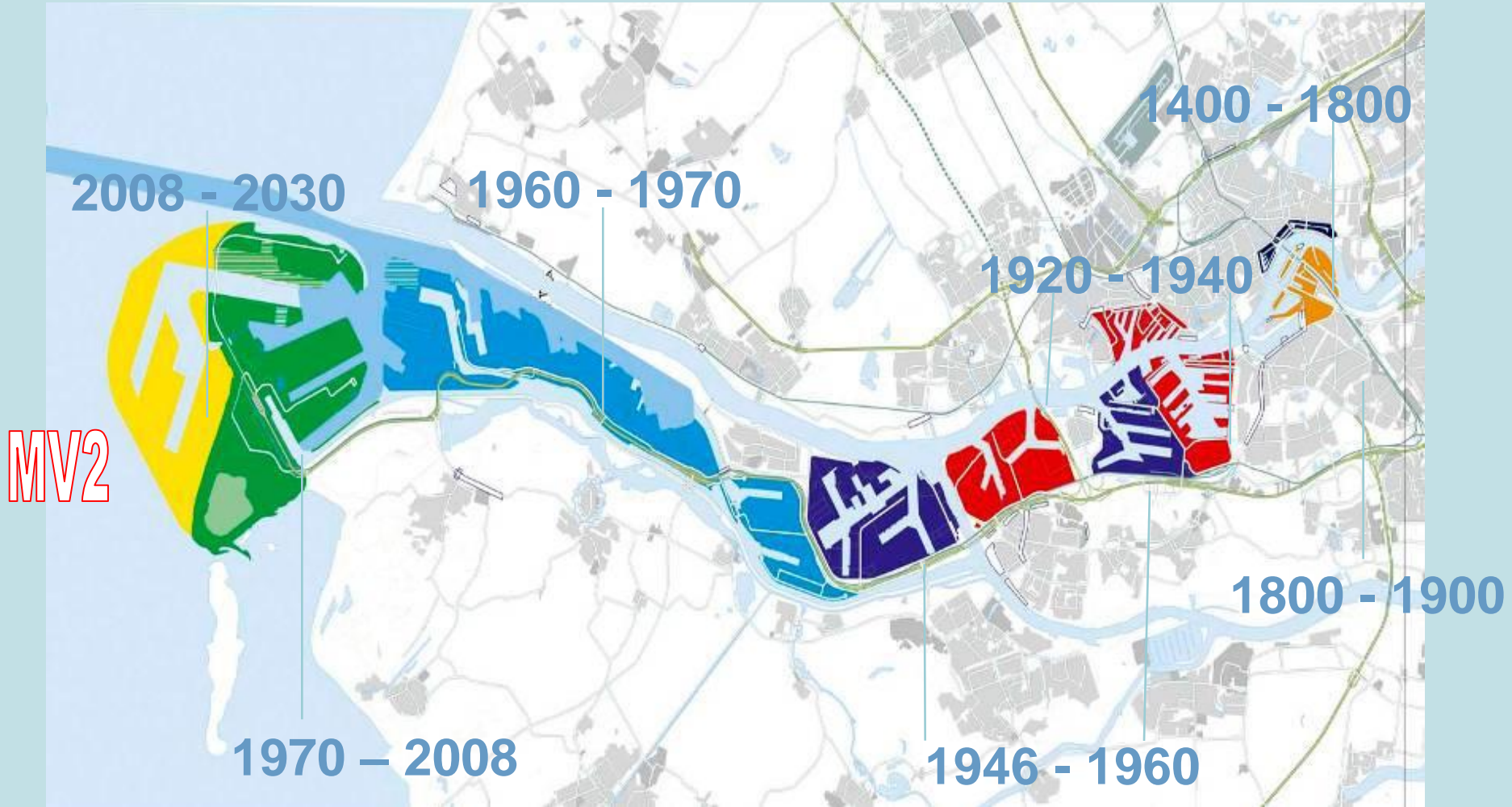
17 November 2017

PMR-MEP Dunes:

Nature balance: profit and loss account i.r.t. MV2

- 2009 – 2017: development of Spanjaards Duin, a valuable new dune area and mega nourishment
- 2011 – 2016: monitoring nitrogen deposition T0, technical report 2017
- 2012/2013 mapping H2130 en H2190 and sites of *Liparis loesseli*, between Goeree en Solleveld
- 2017 Evaluation of “MEP Duinen”
- 2020 PKB evaluation MV2, Rotterdam port extension, 2033 final evaluation

Rotterdam port extension



Maasvlakte 2



construction 2008-2009



Maasvlakte 2



in use 2014 +

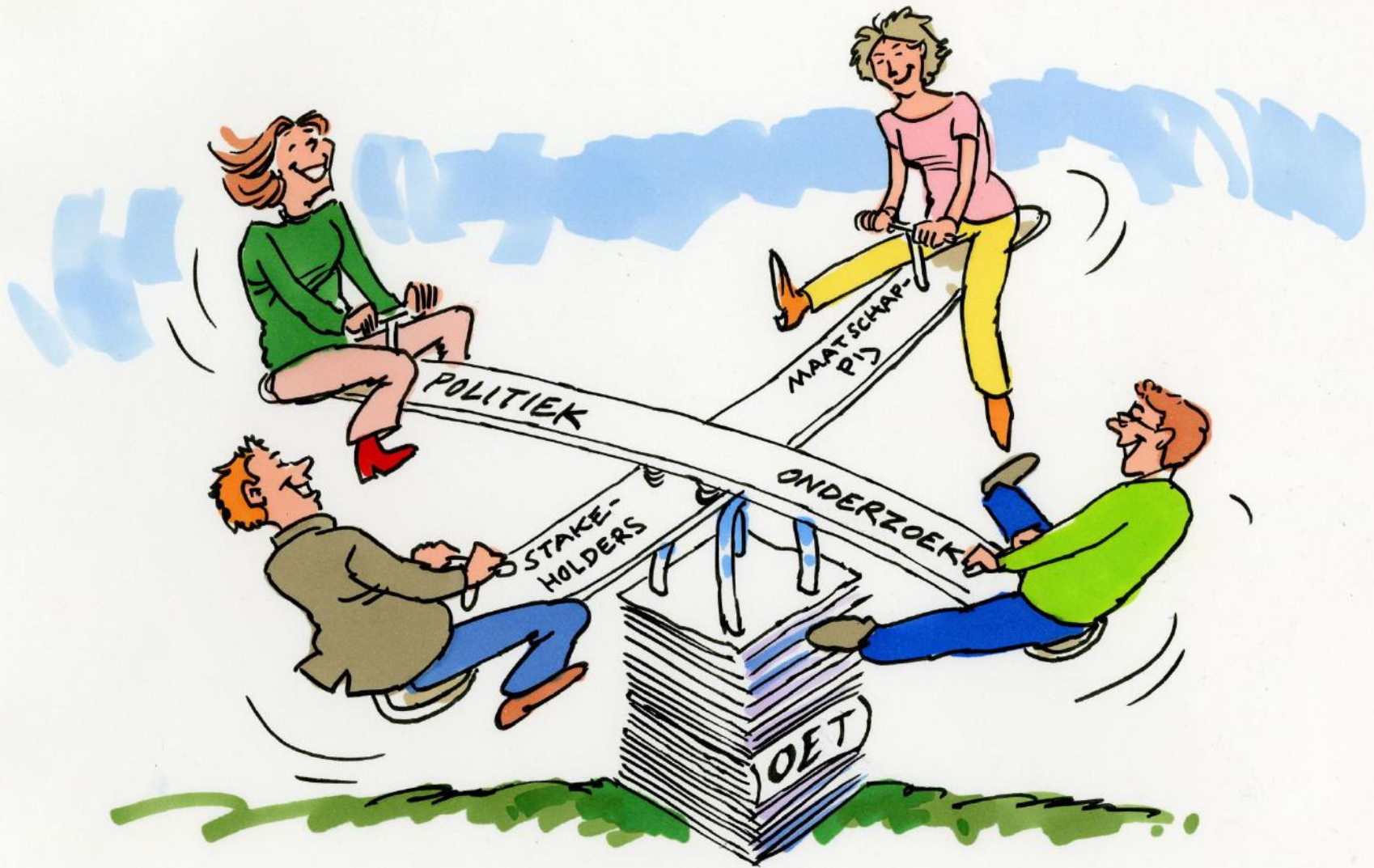


All clear?



Where does N come from?





1) Compensation



- bestaand strand
- nieuw strand
- bestaand duingebied
- nieuw duin
- nieuwe duinvalei
- A locatie profielen



6,1 ha H2190



9,8 ha H2130

Start of works 2008



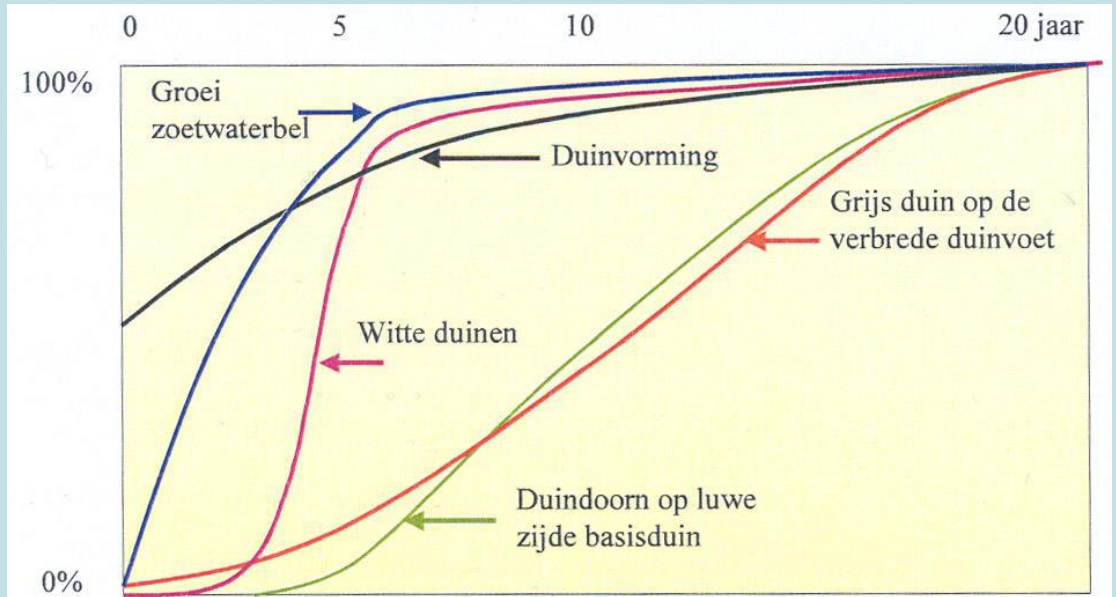
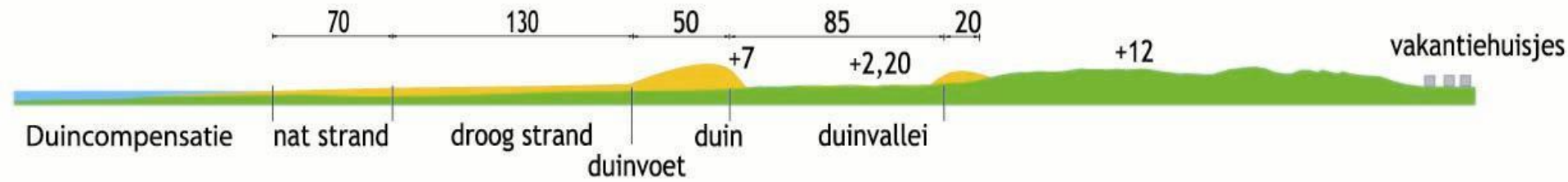
RWS-Projectbureau
Delflandse Kust







Spanjaards Duin





2015

Target areas:

5,9 ha H2190 (+/-)

13,0 ha H2130 (+)

Vegetation:

almost no



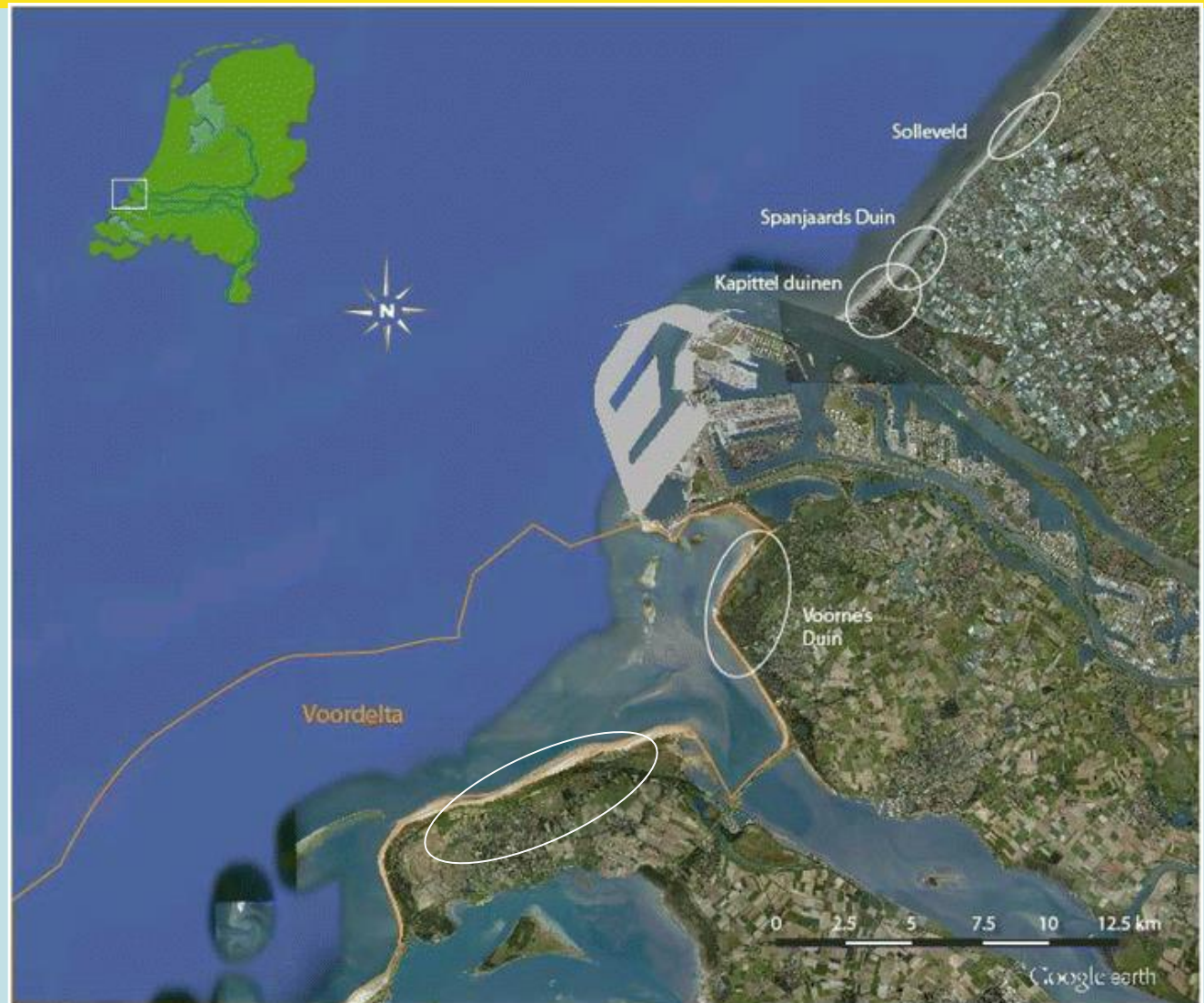


2) Effects



Stikstof deposition, Vegetation, *Liparis loeselii*

T0 research
accomplished
and report
adopted





- Area H2190, H2130 and locations of *L. loeselii* charted, repeated in 2018-2019
- New knowledge about ecology of threatened dune vegetation in relation to management and autonomous succession

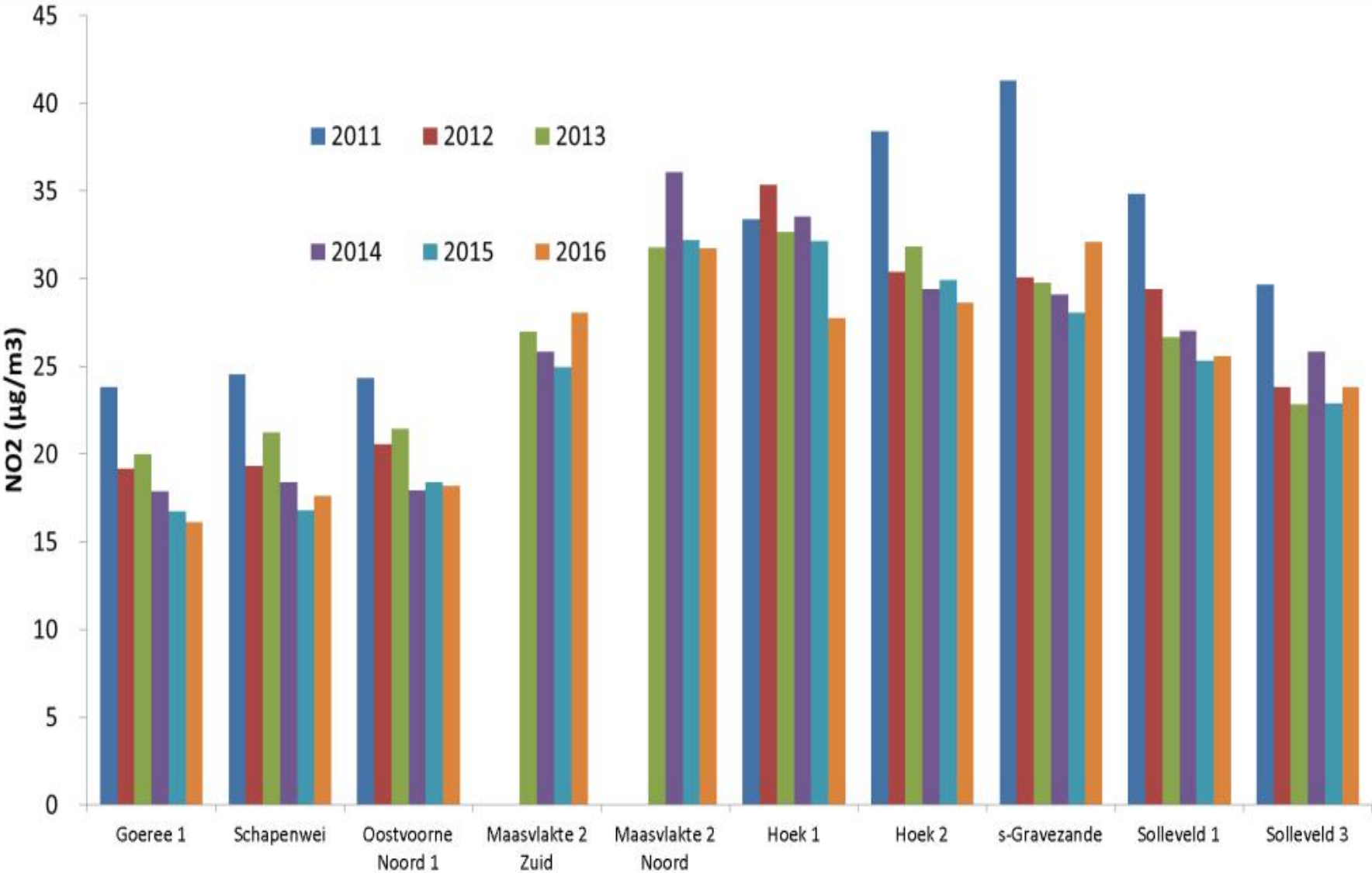


- 2011-2014 19 stations, 2015 - 2016 10 stations along shore, Goeree to Solleveld
- Concentration to calculate wet and dry deposition rates at monthly basis
- 2015 en 2016 Ammonia continuously at HvH, emission sources and mobile network

Coastal differences NO₂



Bron: ECN





- Management by ZuidHollands Landschap evaluated 2015
- N2000 plan Solleveld en Kapittelduinen includes targets for Spanjaards Duin PMR 2016-2021
- Extra sand removal 2018 ca 35000 m³
- Management focus at development of vegetation



- T_0 in region Rijnmond is complex, also without MV2
- Measurable gradients in deposition levels; NO_2 and NH_3 important
- Critical deposition level of 1,1 kmol/ha/year for Habitat type H2130A is surpassed
- Natural NH_3 sources do occur (algae, sea birds)