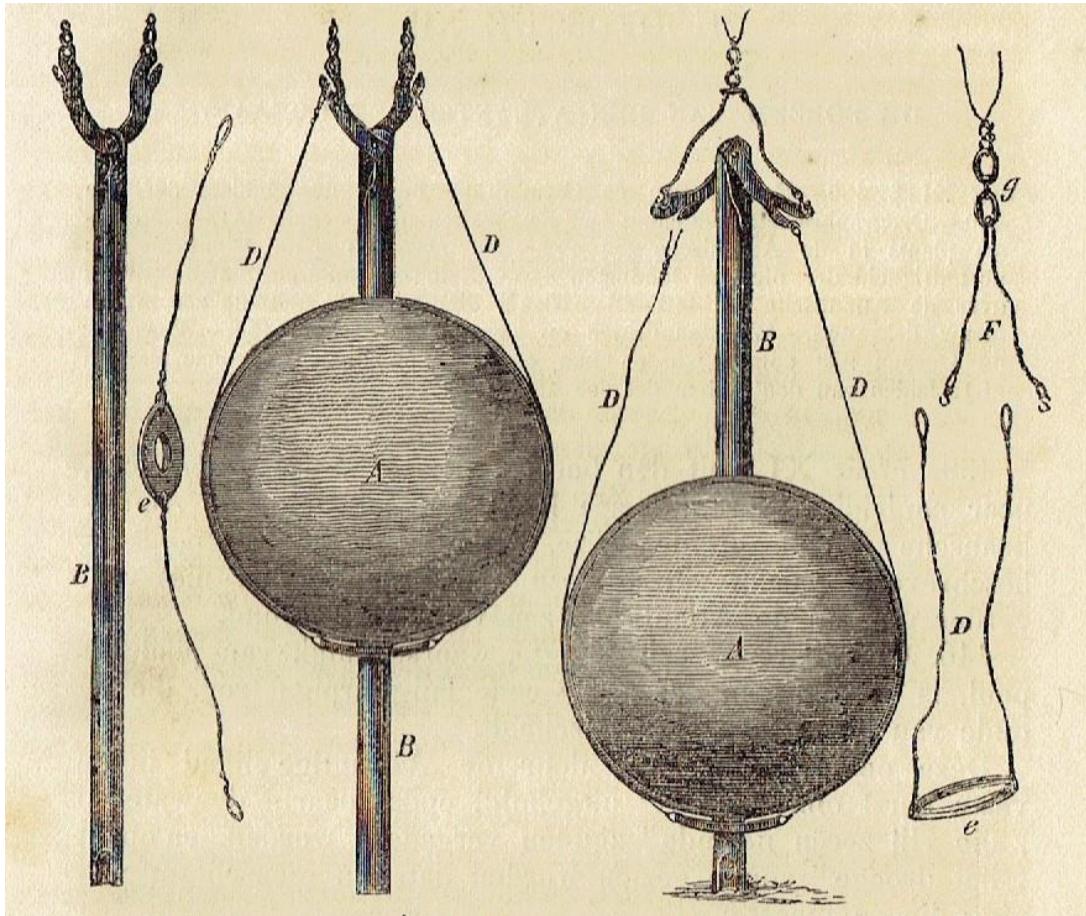




Rijkswaterstaat
*Ministry of Infrastructure
and Water Management*

Reflection on acoustic imaging

Ad Stolk
Rijkswaterstaat Sea and Delta



(Maury, 1854/55)



Navigation by depth and sediment

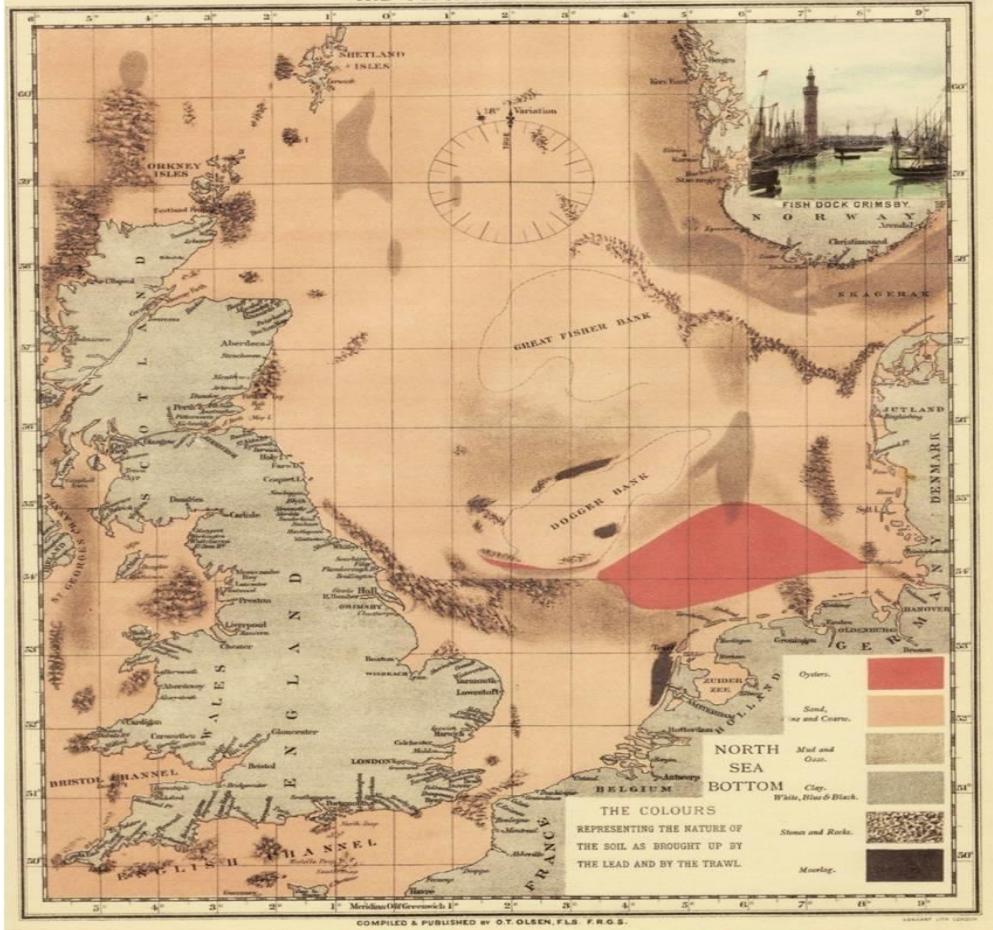
Master Jackman in 1578:

*"Sounded and had 70 faddems, oosy sand,
whereby we judged us to be northwards of
Scilly."*

(Theberge, 2016)



THE PISCATORIAL ATLAS.

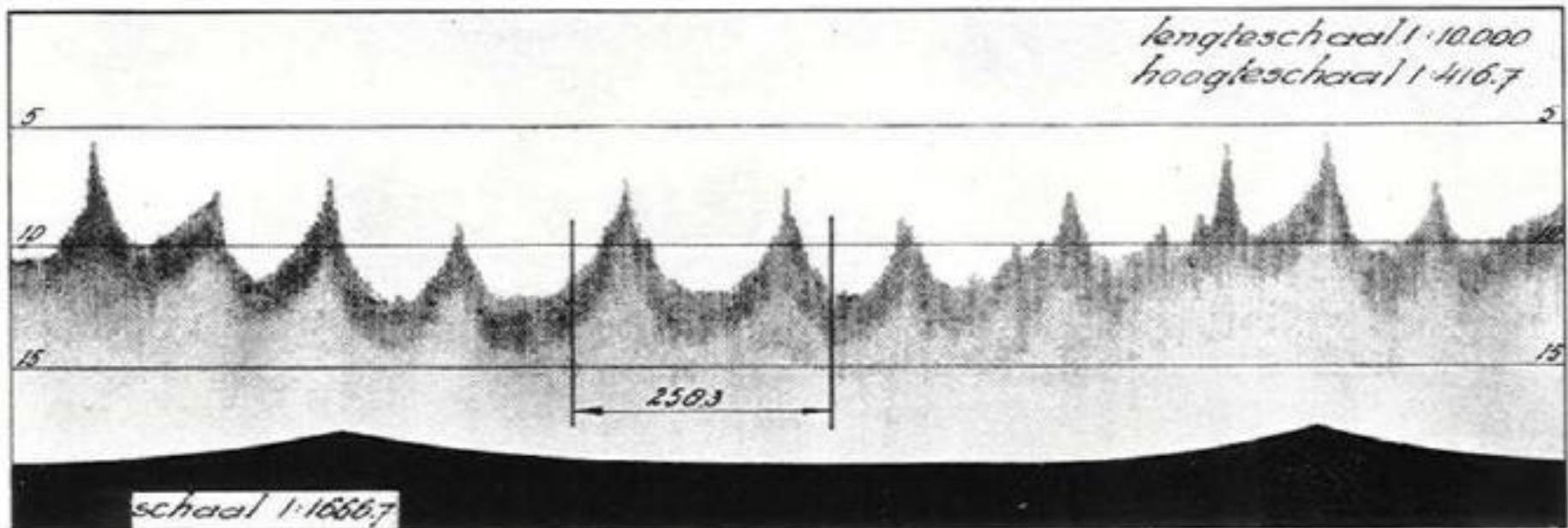


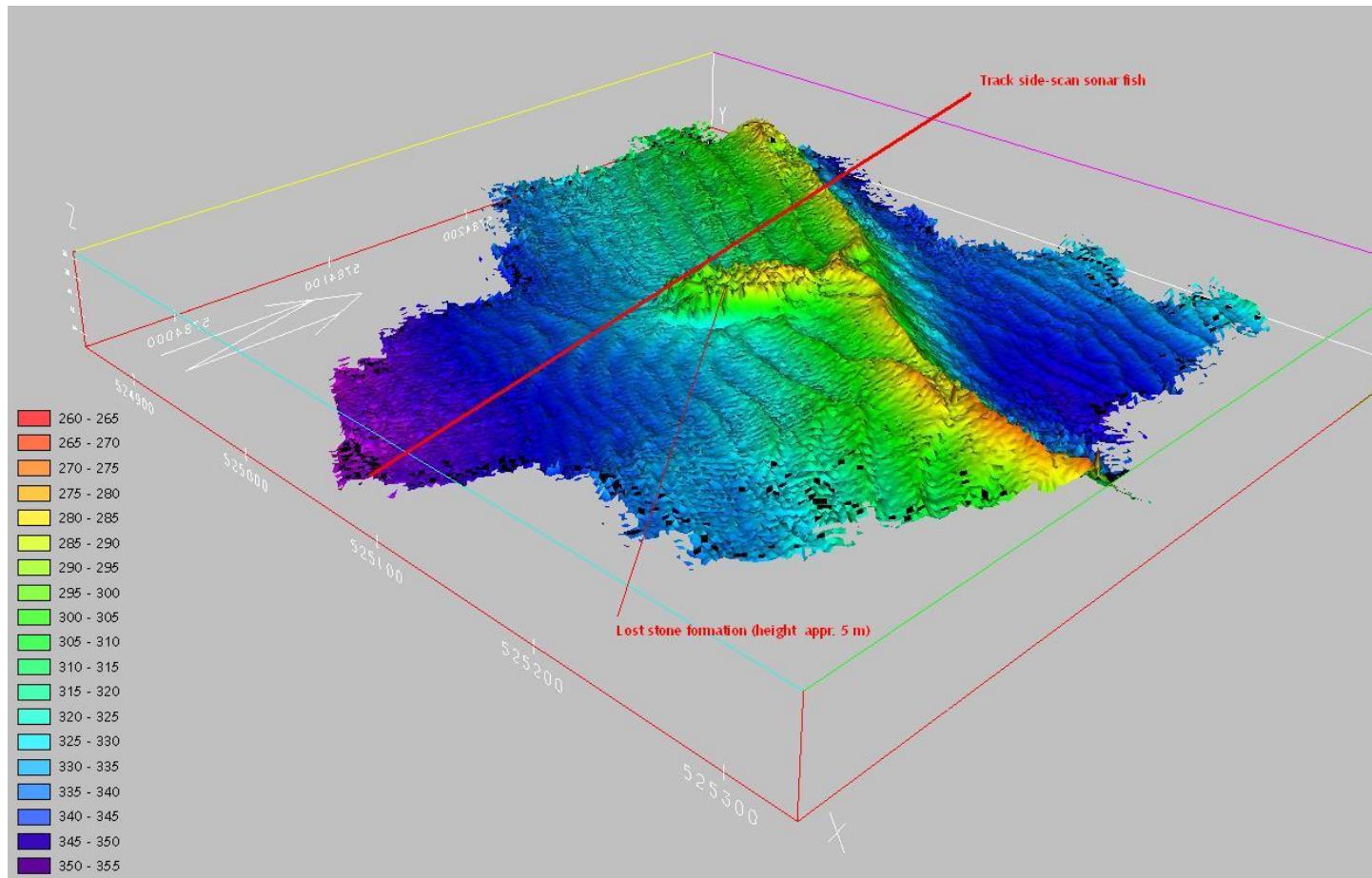
(Olsen, 1883)



Echo sounding off Goeree

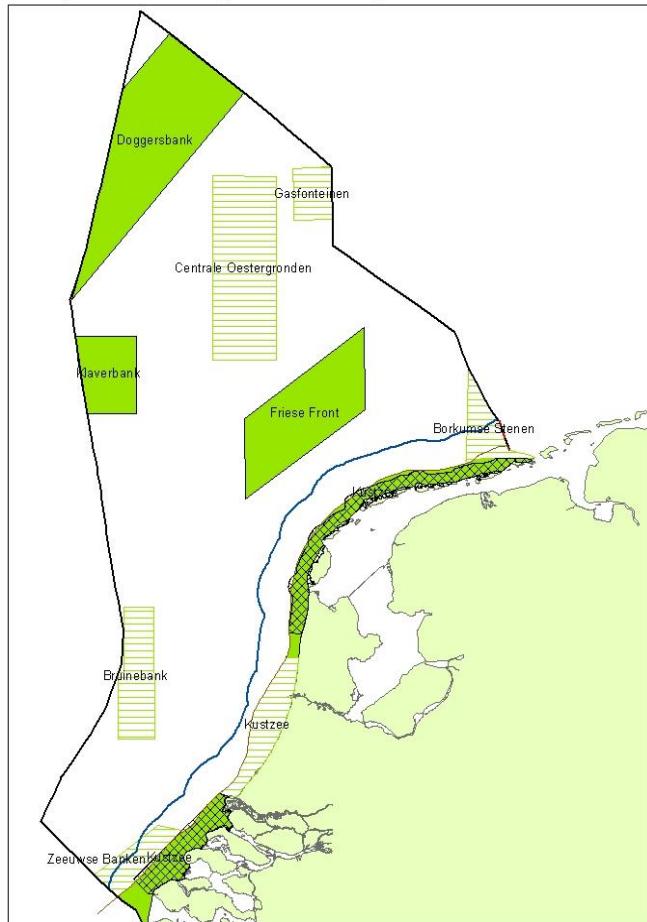
(Van Veen, 1936)







Alle gebieden met bijzondere ecologische waarden



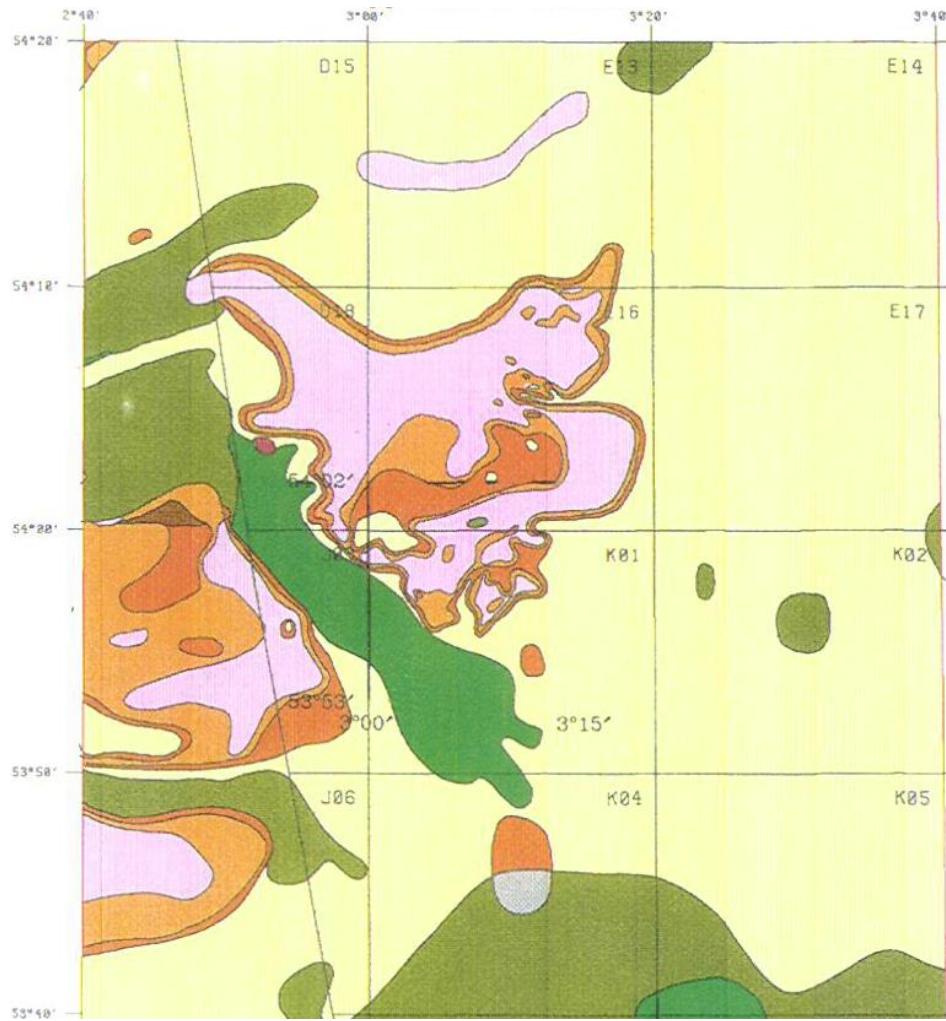
Legenda

Grenzen NCP	Gebieden met bijzondere ecologische waarden
Grens 12-mijl zone	Begrensd en beschermde gebieden IBN 2015
Grens plangebied IBN 2015	Onder gebieden
Dorogaande NAP -20m lijn	Topografie
Vogel- en Habitatrichtlijn gebieden	Land

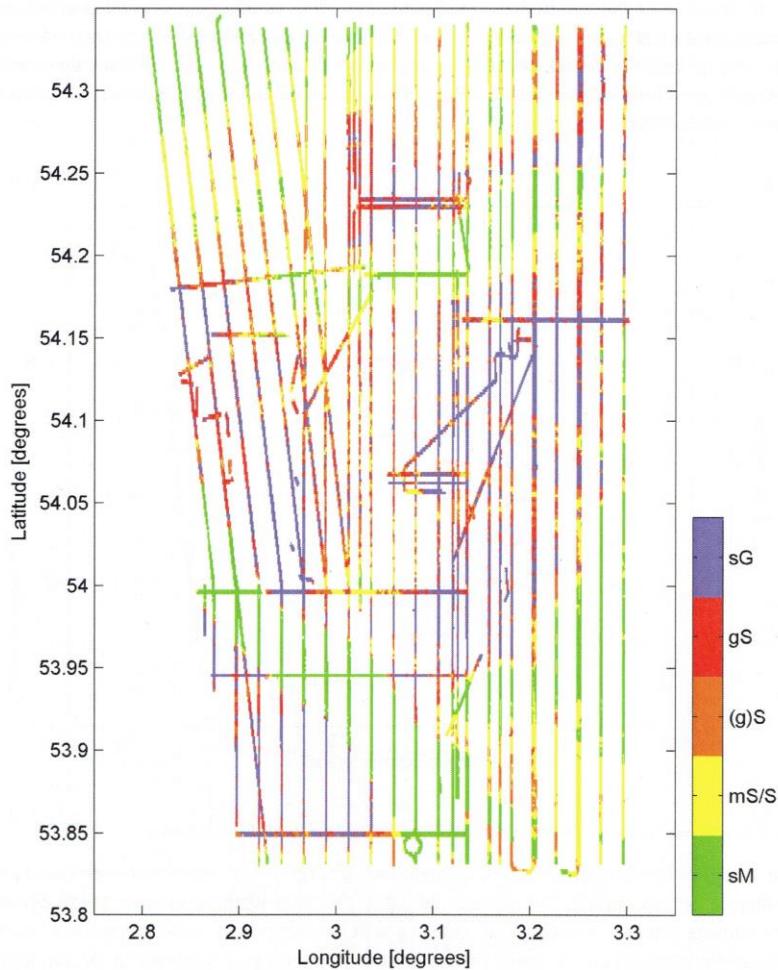
0 5 10 20 Kilometers
Ookkaal 1:200.000
Rijksoverstaat Noordzee



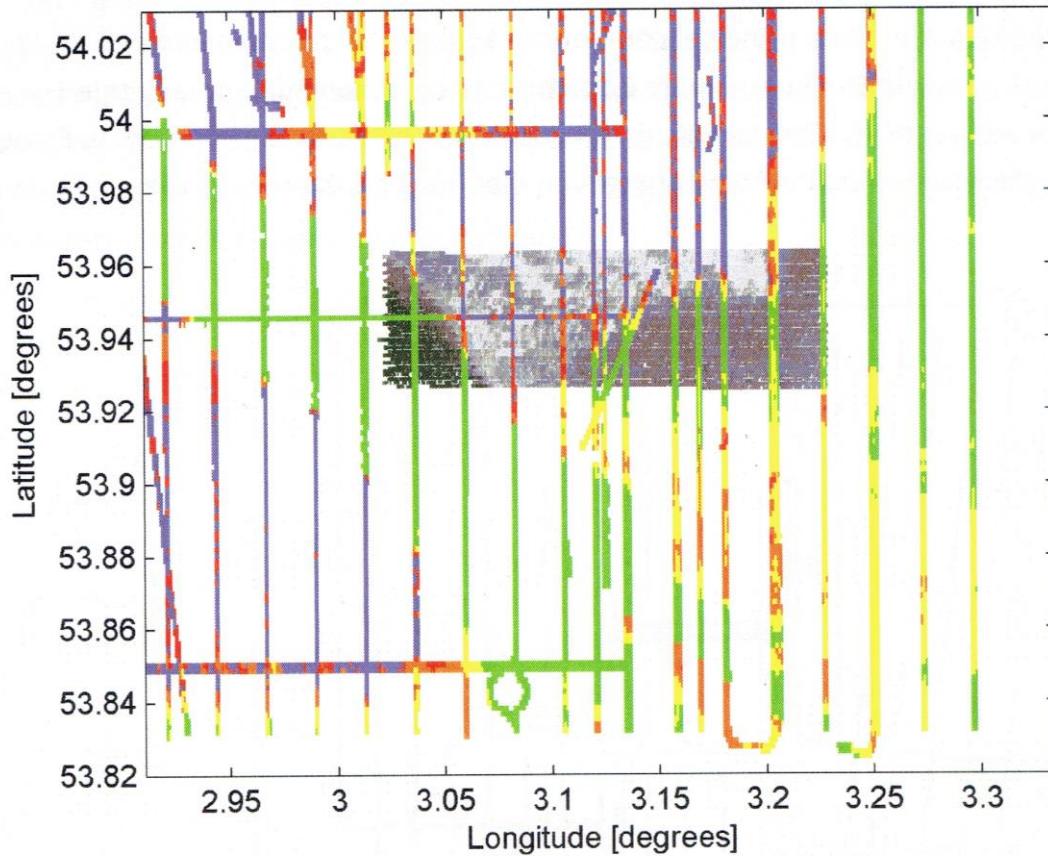
*Photos:
Godfried van Moorsel*



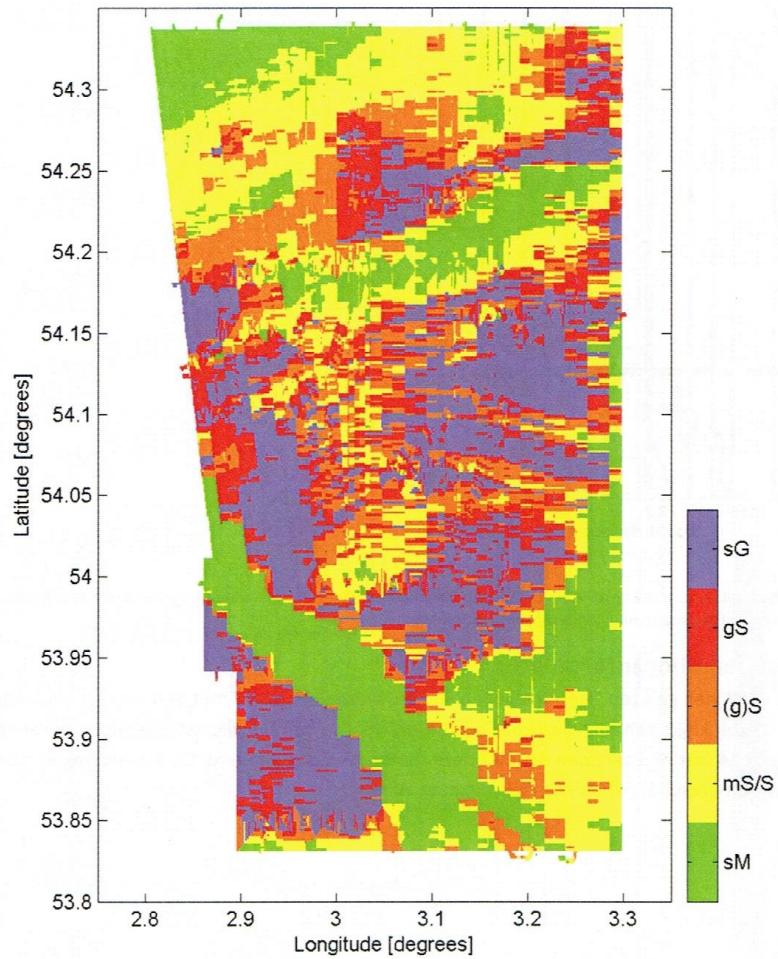
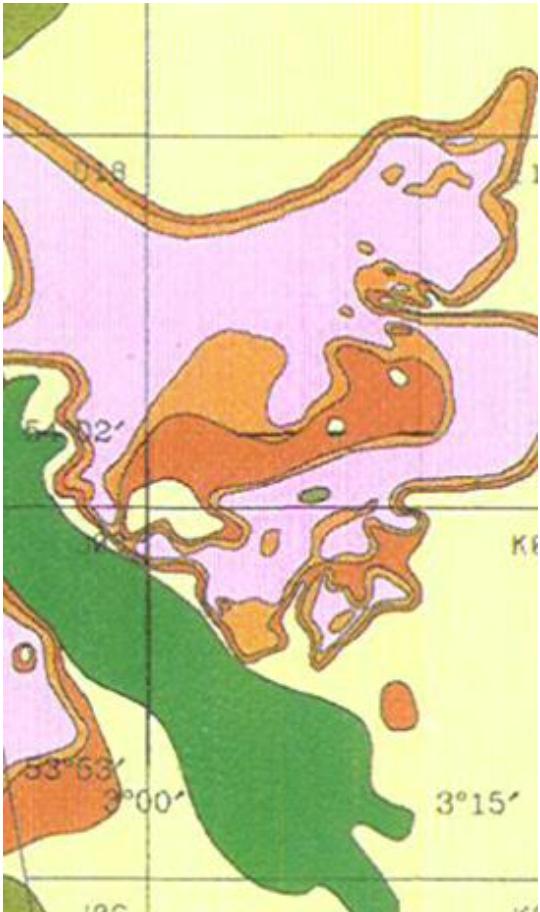
(BGS & RGD, 1987/88)



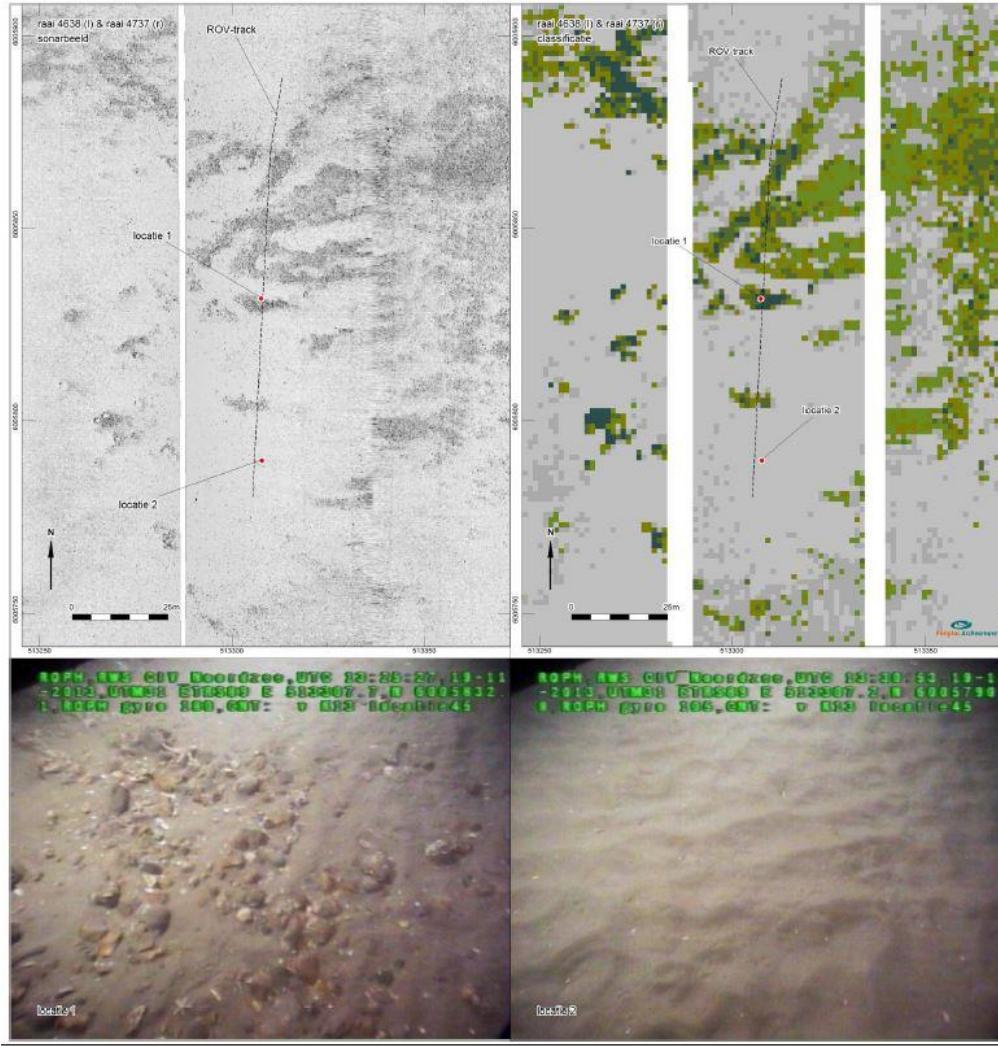
(Janmaat, 2015)



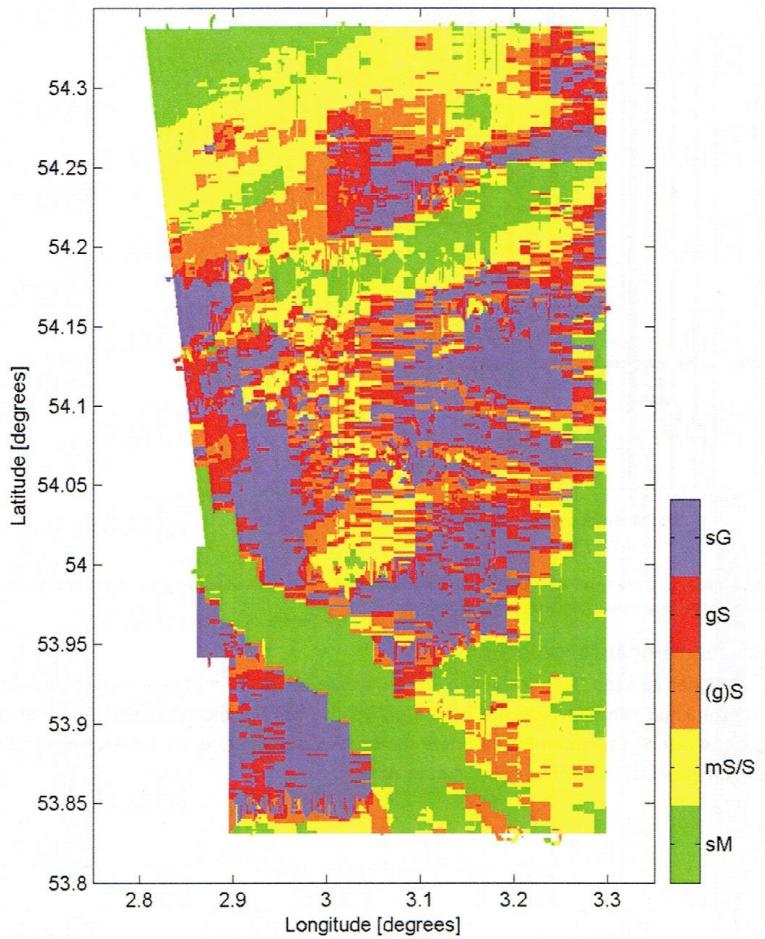
(Janmaat, 2015)







(Periplus, 2015)



(Janmaat, 2015)



(Periplus, 2015)



Rijkswaterstaat



(Van Dijk et al., 2019)



Interpolation

- Limited shipping time
 - Practical
 - Financial
- Full seafloor coverage often not possible
- Good interpolation methods needed for all types of acoustic imaging



Ground truth

- Sampling
 - Boxcores (sand, silt, clay)
 - Hamon cores (gravelly seafloor)
- Optical
 - Photo
 - Video
- Ground truth during the same survey



Acoustic imaging

- Backscatter and SSS complementary
 - Penetration depth
 - Frequency
 - Beam width



Mission habitat mapping

- Combine measuring techniques and methods
- Improve interpolation methods
- Develop or improve a ‘recipe’ for habitat mapping