



Royal Netherlands Navy

NL LAT2018  
Dutch LAT 2018 model

NL GEO2018  
Dutch 2018 quasi-geoid  
model

Hydrographic Service  
Geodesy and Tides



## NL LAT2018

Technical University Delft – Nevref research team ( R. Klees, D.C. Slobbe )

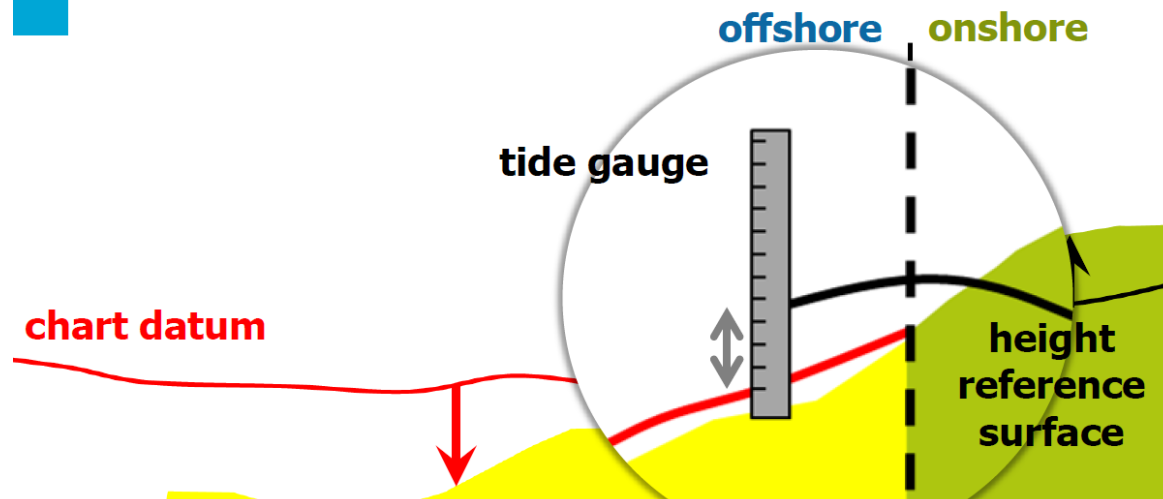
Details: IHO – TWCWG – national presentations → TWCWG3-6.10.1+6.10.3

Realisation\_of\_a\_mutually-consistent\_set\_of\_on-and\_offshore\_Vertical\_reference\_surfaces-NLD.pdf)

[https://www.iho.int/mtg\\_docs/com\\_wg/IHOTC/TWCWG3/TWCWG3.htm](https://www.iho.int/mtg_docs/com_wg/IHOTC/TWCWG3/TWCWG3.htm)



## The problem...



Separation between chart datum and height reference surface is a *spatially varying* function, which is only known at tide gauges!



How to make reliable simulations of flood events?



How to assess the impact of rising sea level on the coastal morphology?



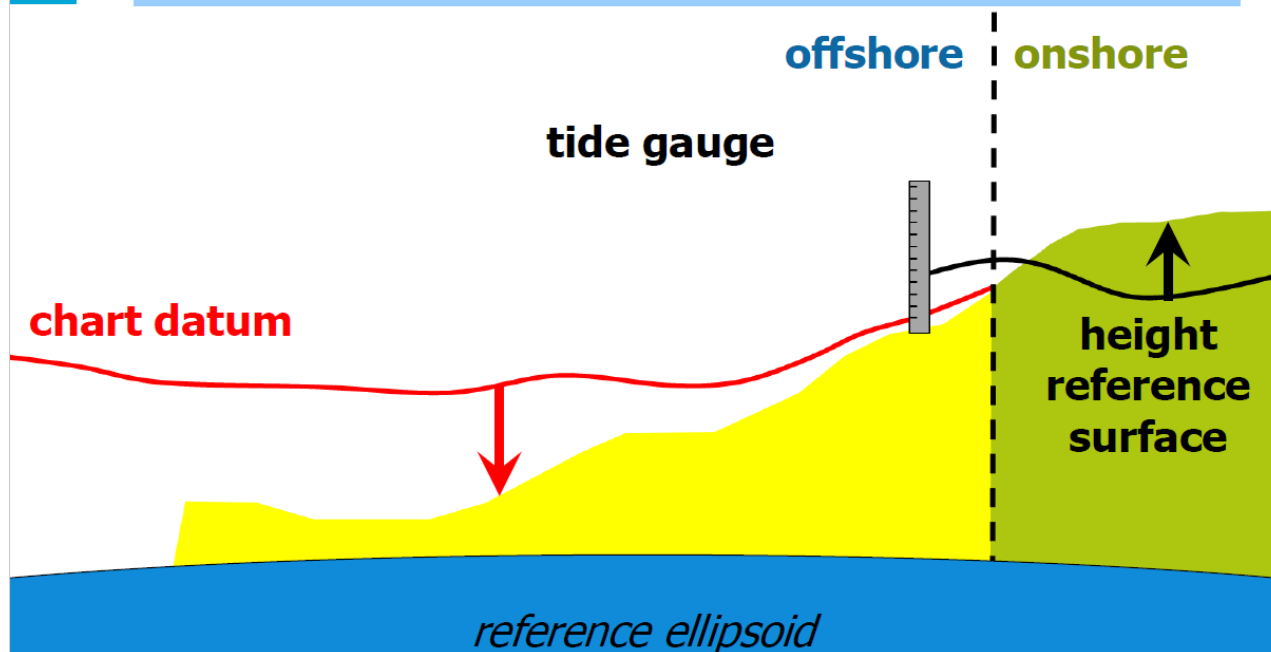
The separation between height and depth reference surfaces is a spatially varying function, which is only known at tide gauge locations.

This separation must be known everywhere for coastal zone management in a changing climate!



## The solution...

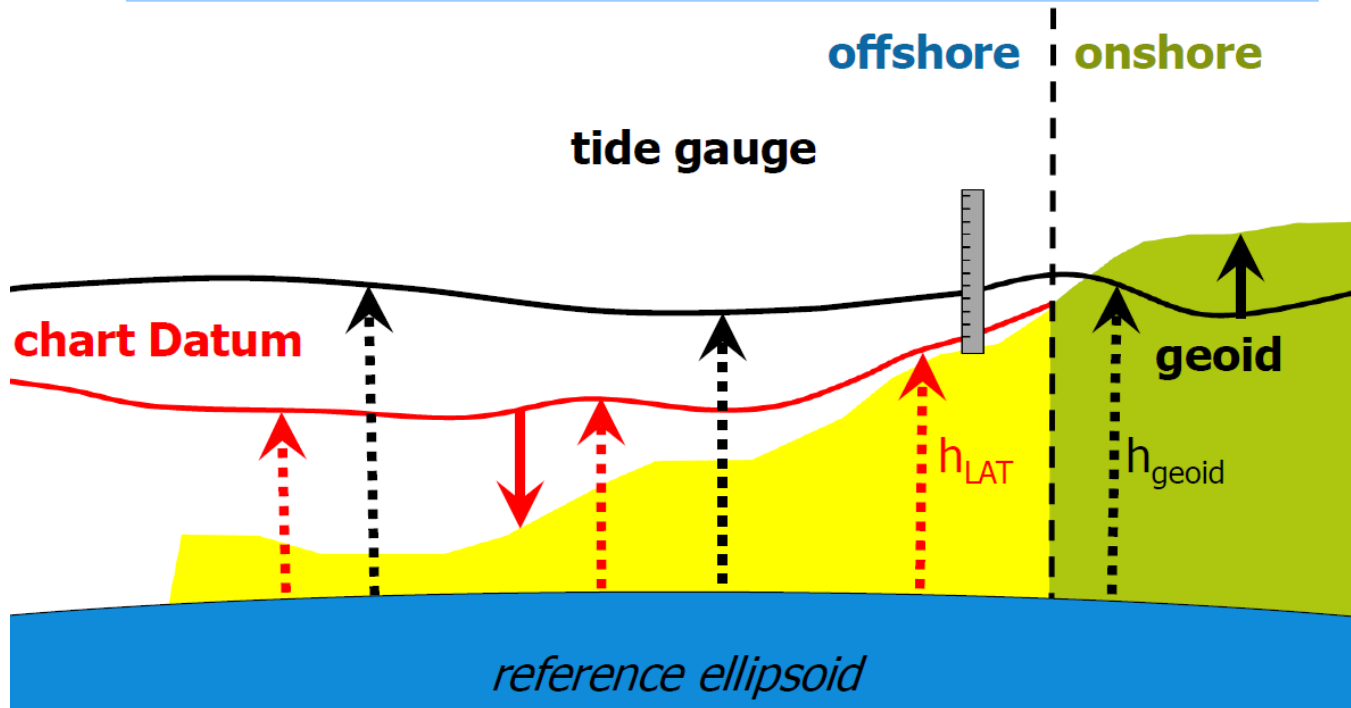
*Refer chart datum and height reference surface to a common reference surface!*





## The solution...

*Refer chart datum and height reference surface to a common reference surface!*





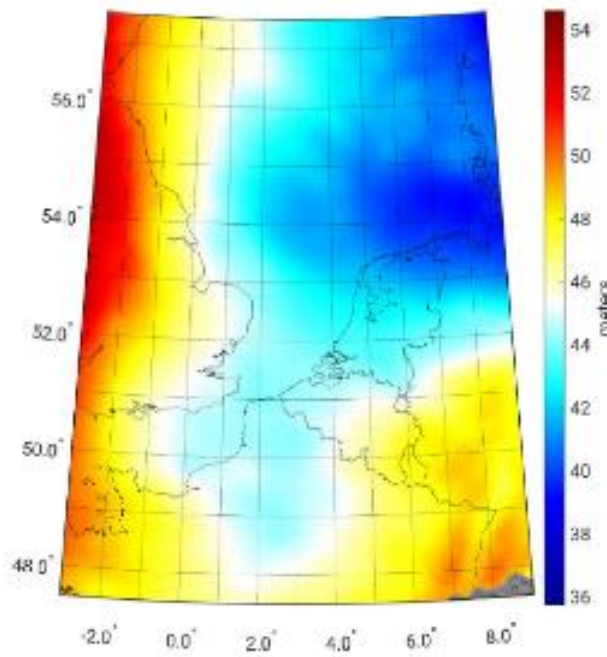


The Dutch approach to realize chart datum with respect to a reference ellipsoid (GRS80) uses the geoid rather than the MSL as the intermediate surface.

For details about the approach to realize h-LAT and h-geoid I refer to the TU Delft – Nevref research team ( R. Klees, D.C. Slobbe )



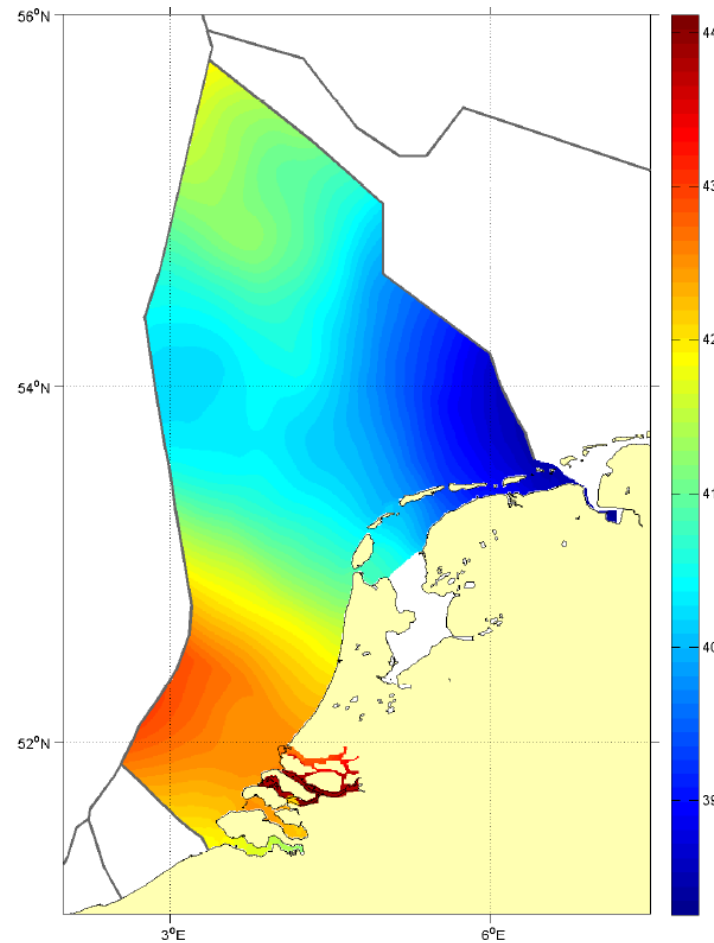
## NLGEO2018 - gravimetric quasi-geoid



Region	Nr	Rms (cm)	Range (cm)	Mean (cm)	Std (cm)
Netherlands	82	2.0	<b>3.5</b>	-1.9	<b>0.66</b>



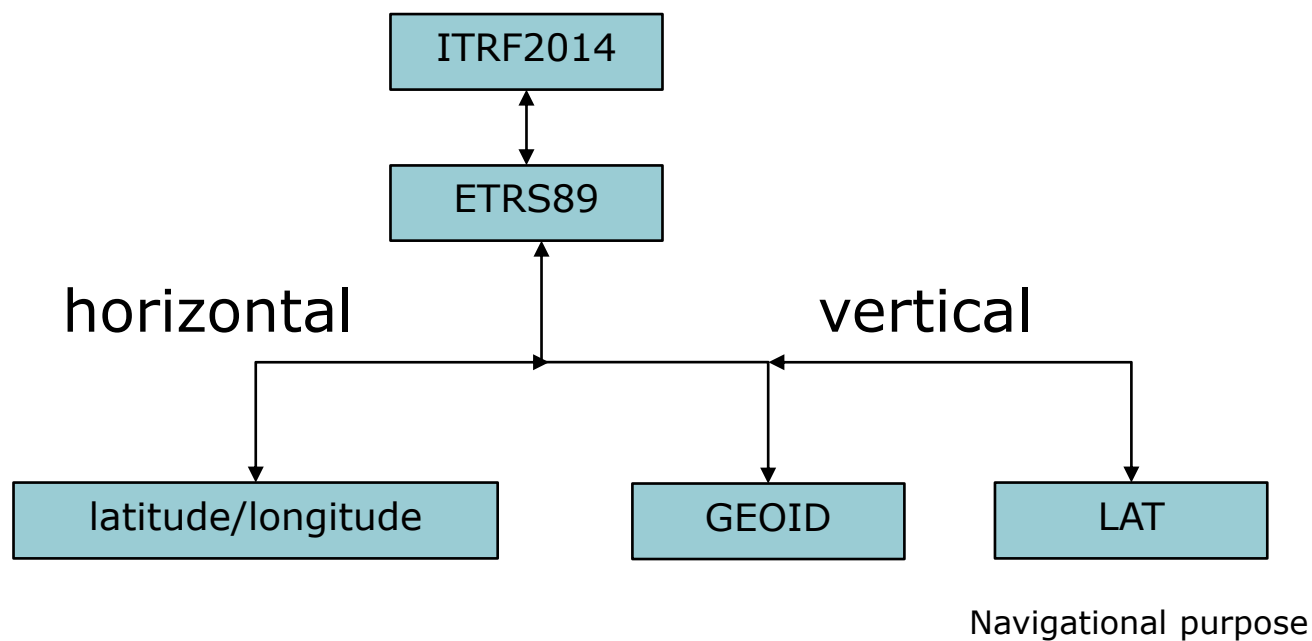
## NL LAT2018



Region	Nr	rms (cm)
North Sea	19	<b>6.6</b>



# Geodetic Coordinate Systems at Sea





## Vertical references in use at sea/coastal zone

