

Deltares

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4 jaar monitoring van het Amelander Zeegat met Xband-radar

Matthijs Gawehn

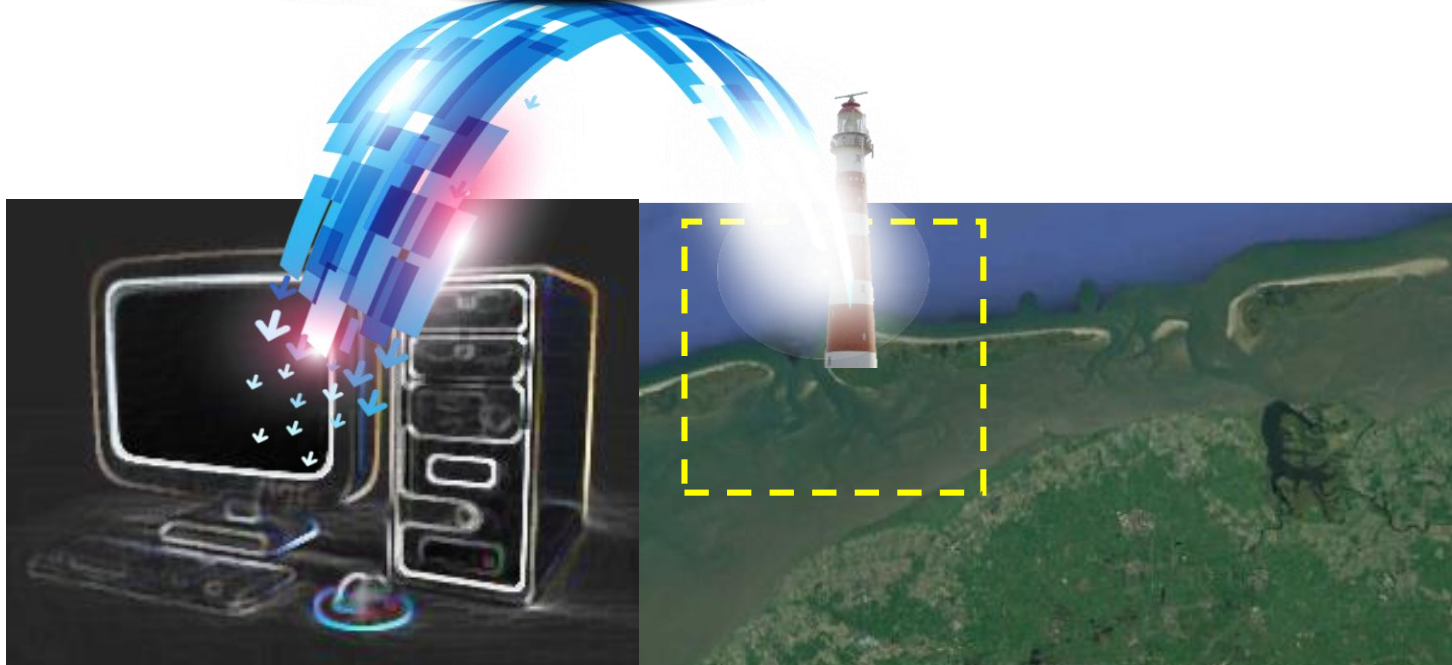
11 februari 2022

Hoe is het begonnen?





- Bestaande navigatie (X-Band) radar
- Kustegenese 2
 - Rijkswaterstaat, Deltares, SEAWAD



...lokale computer
voor data analyse alle
40-60 min
24/7

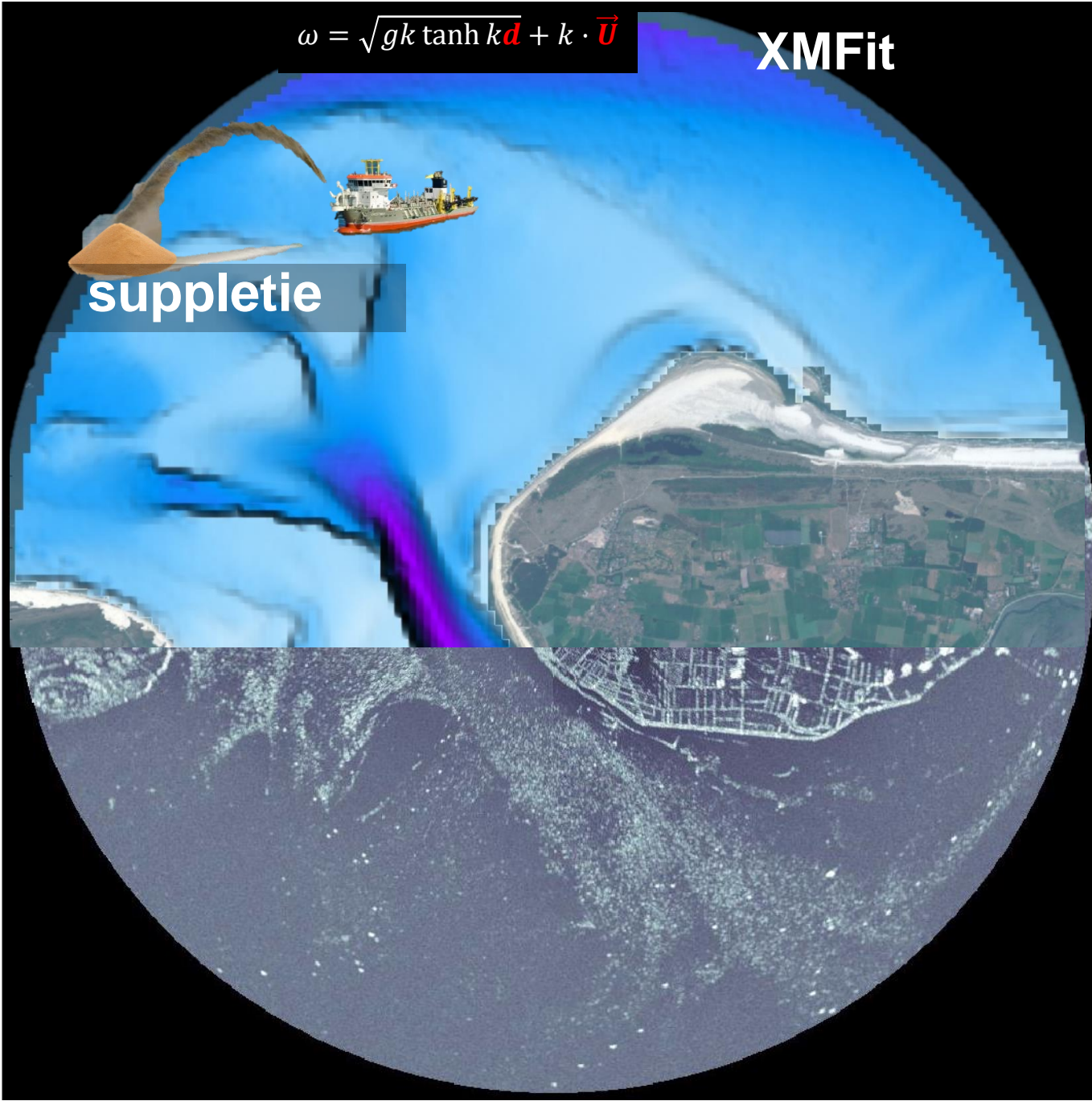


...vaklodgingen
alle 3 jaar

$$\omega = \sqrt{gk \tanh kd} + k \cdot \vec{U}$$

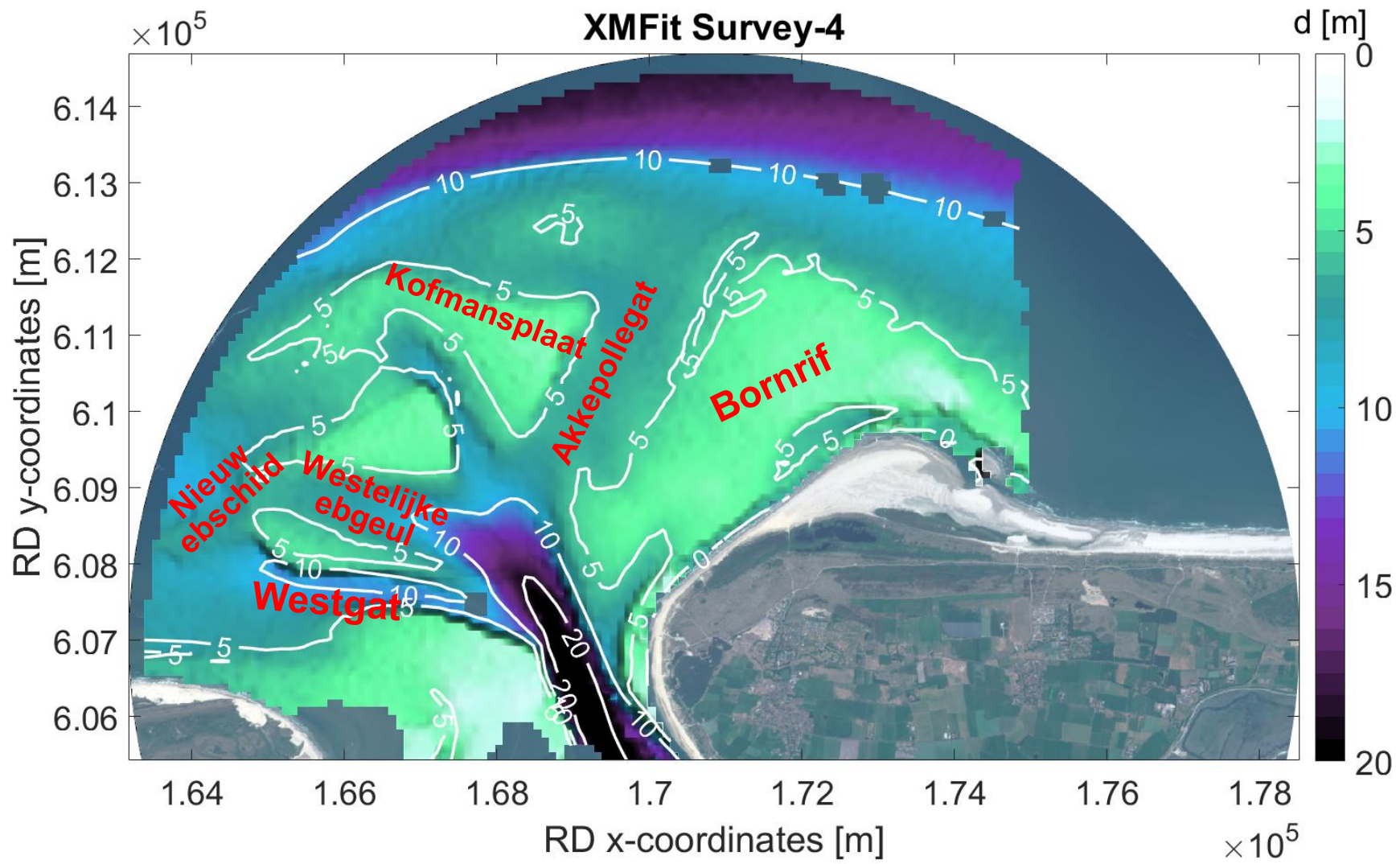
XMFit

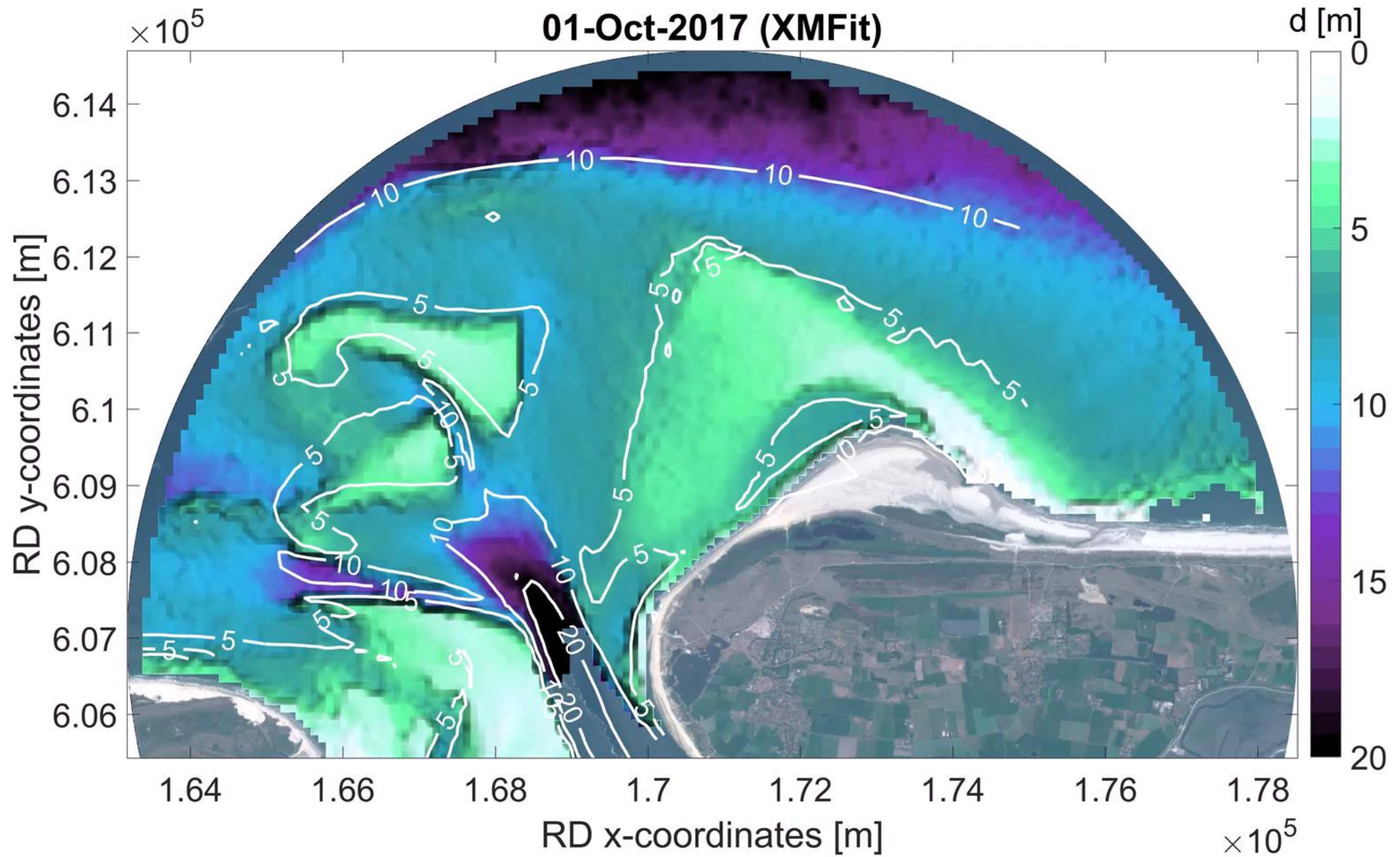
suppletie



Hoe zag het zeegat eruit de afgelopen 4 jaar?



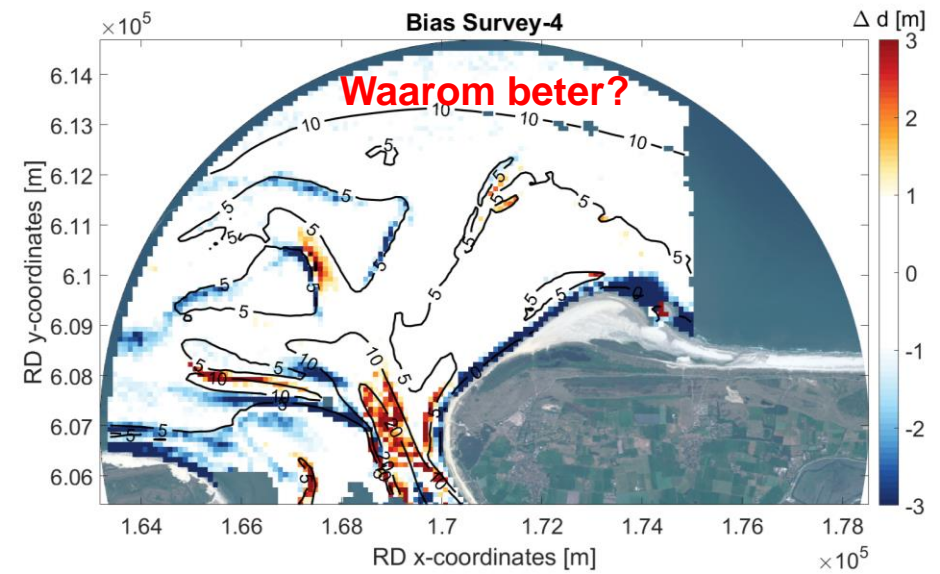
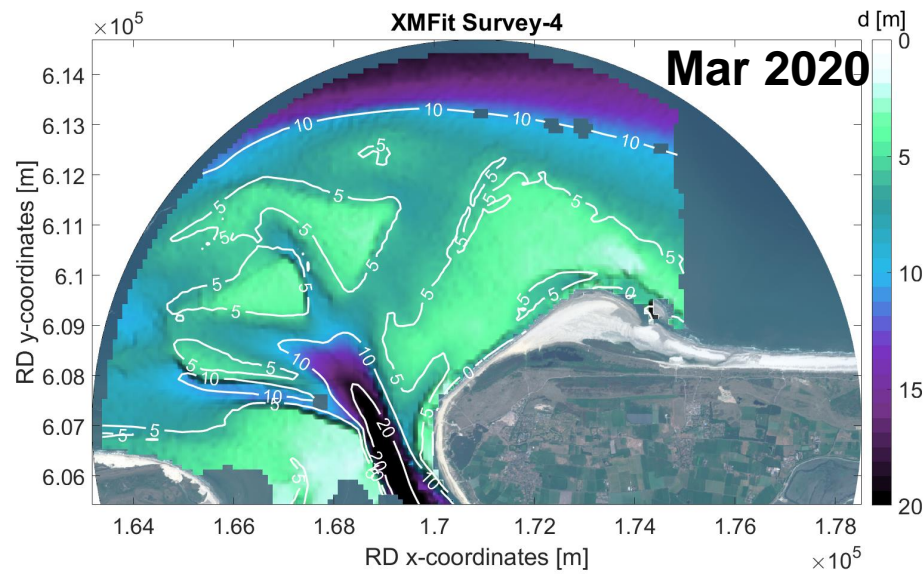
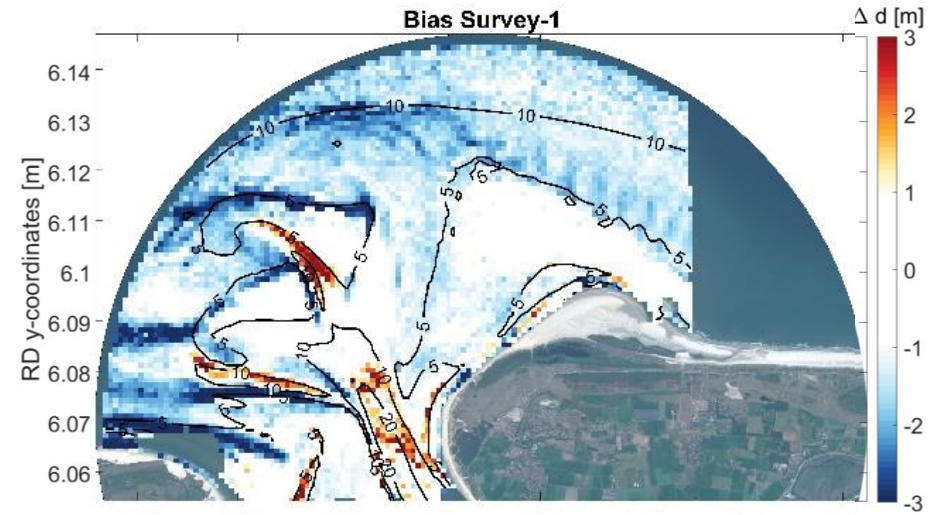
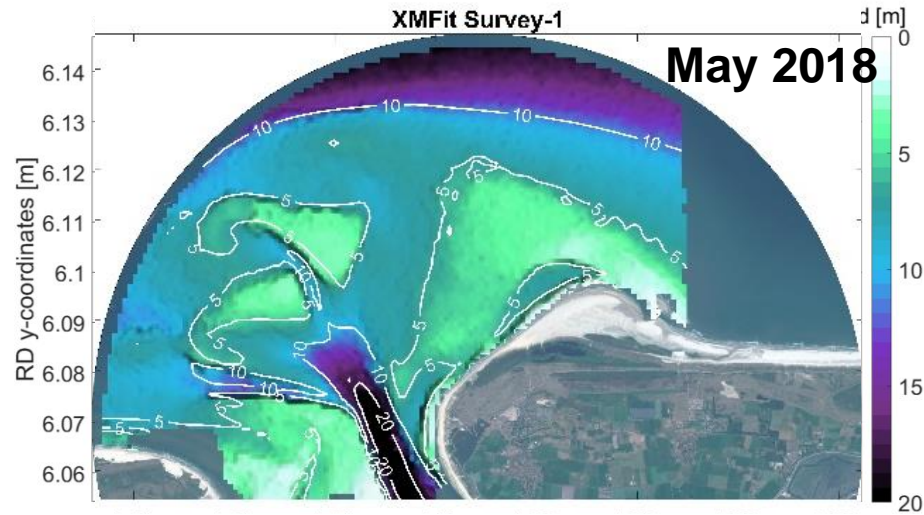


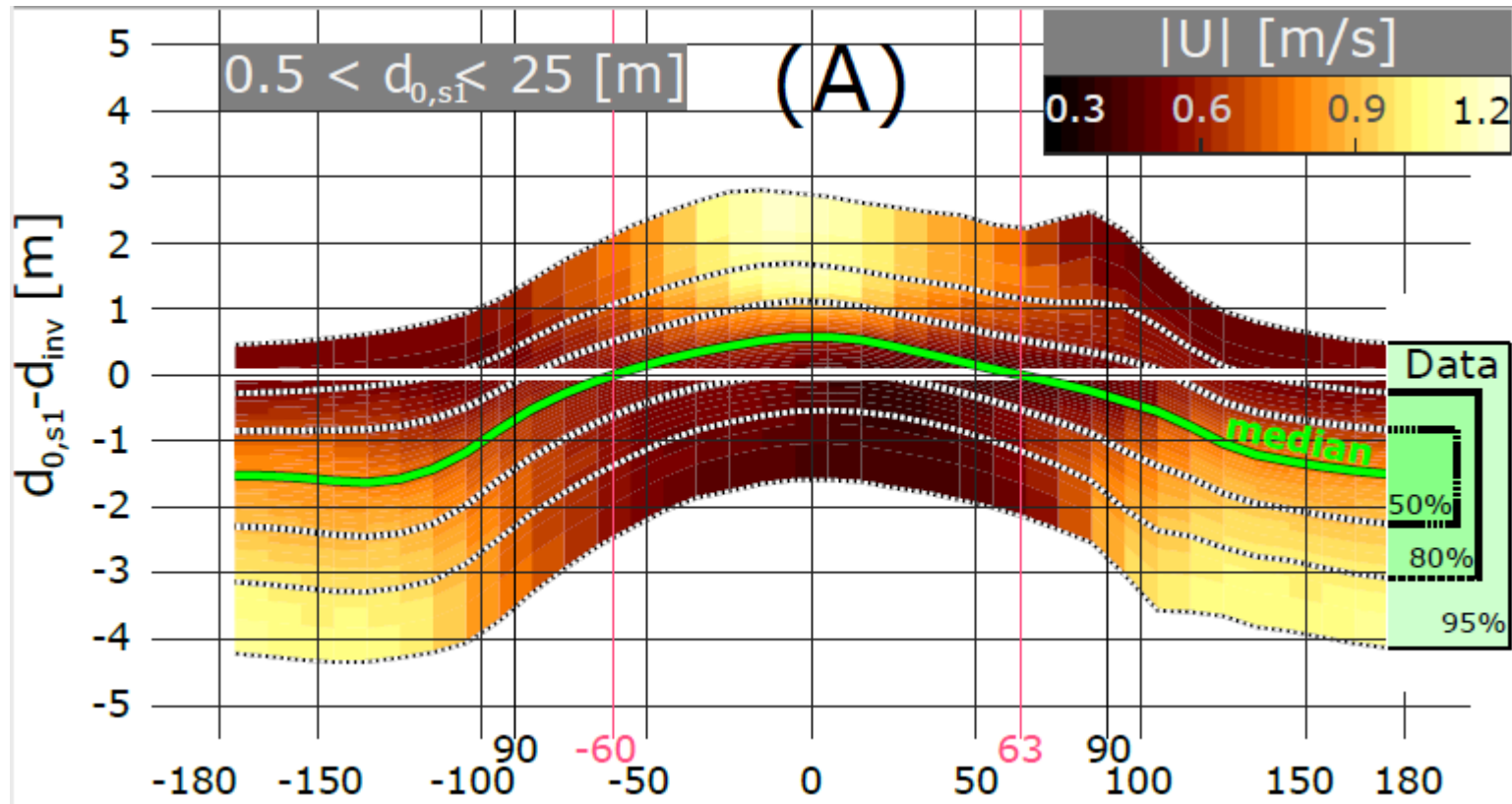


Hoe nauwkeurig waren de schattingen?



Verskil met vakklodingen

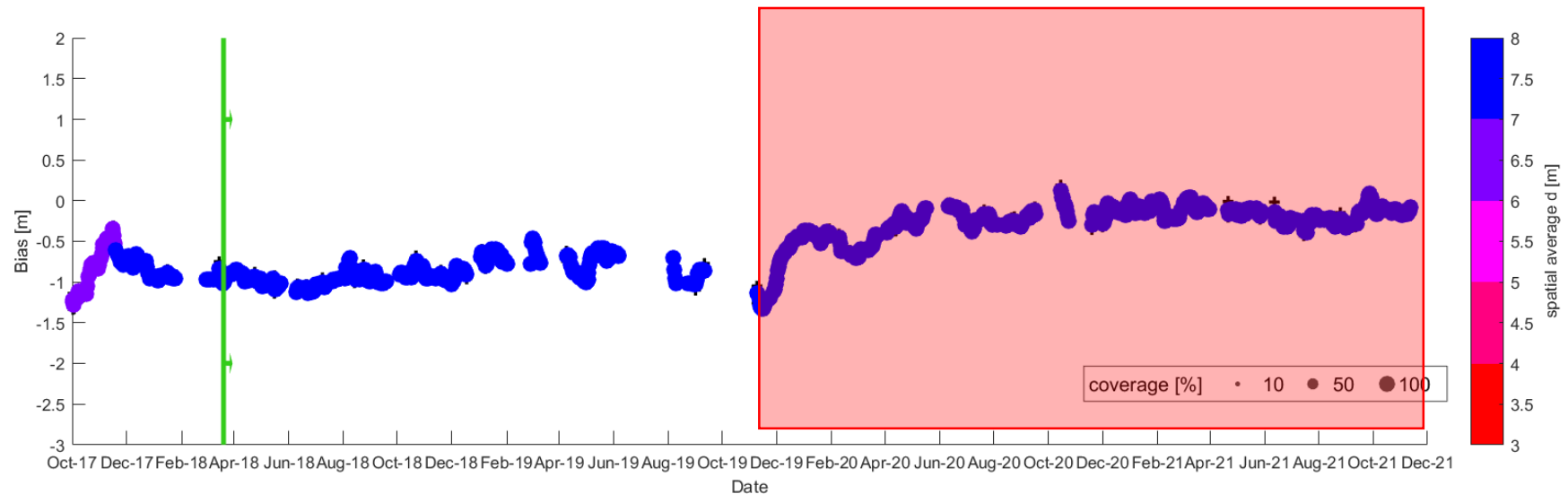




→ Suggestie: Hoge snelheidschattingen onderdrukken

nieuw XMFit regressie schema:

$U < 0.75 \text{ m/s}$



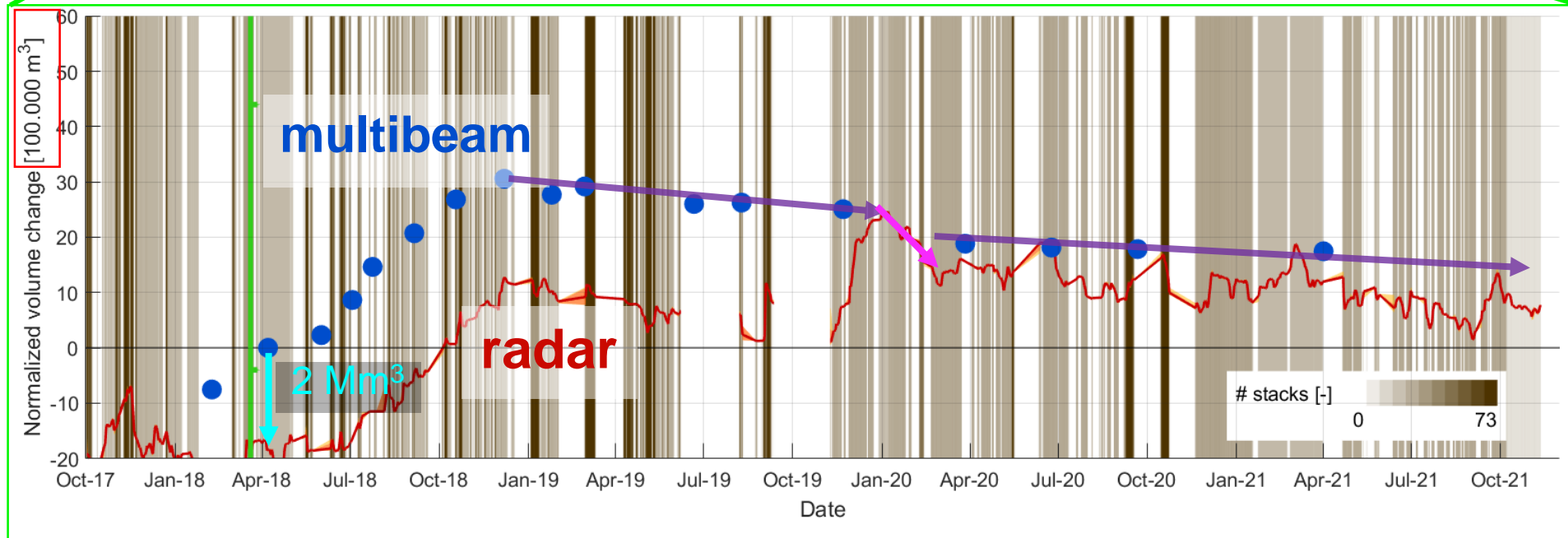
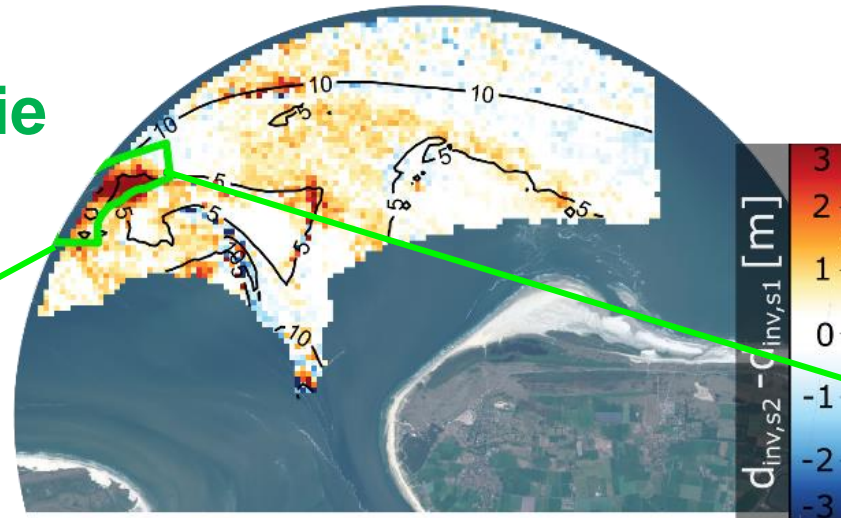
→ Suggestie: Hoge snelheidschattingen onderdrukken

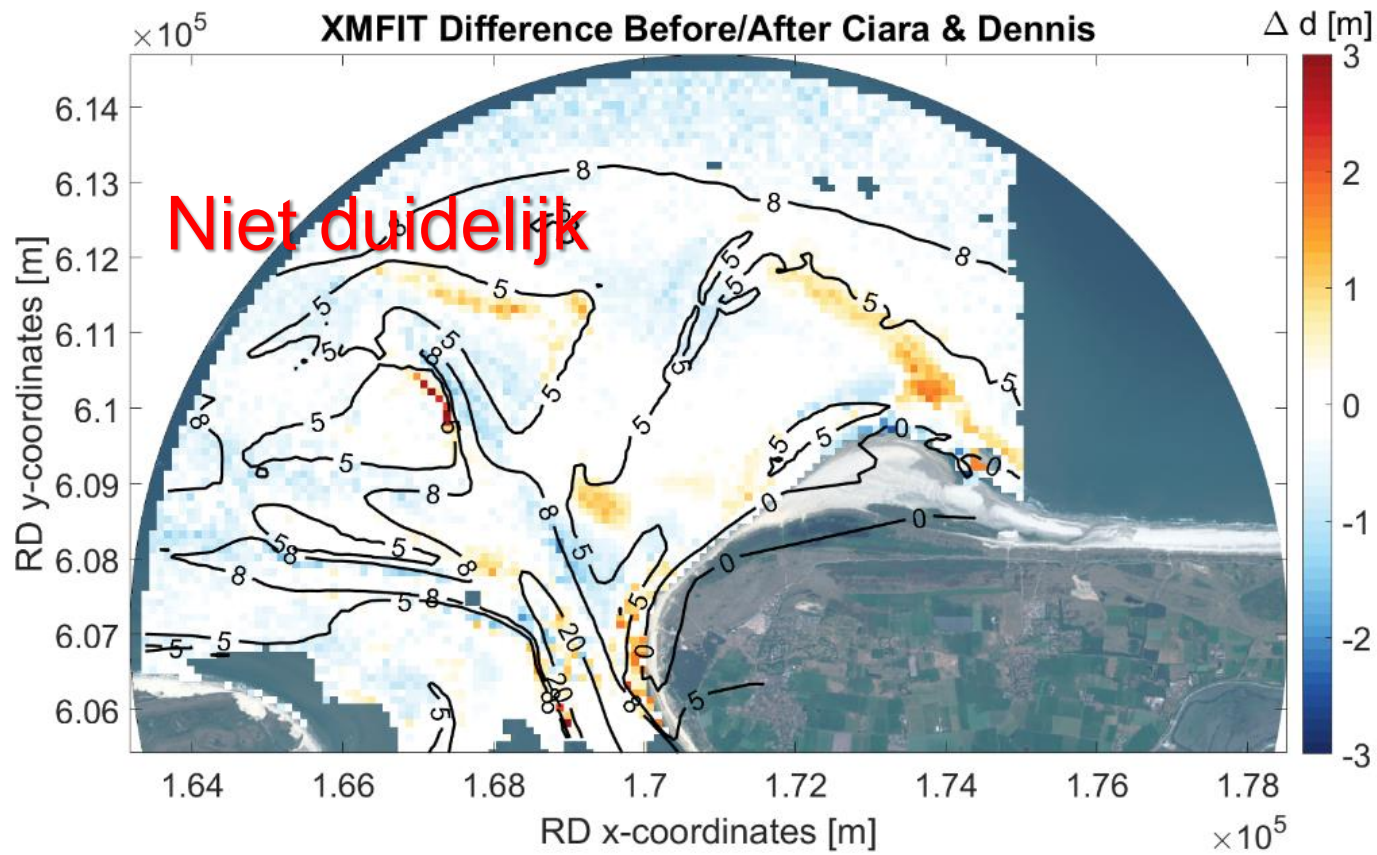
→ Effectief !

Wat deed de suppletie?



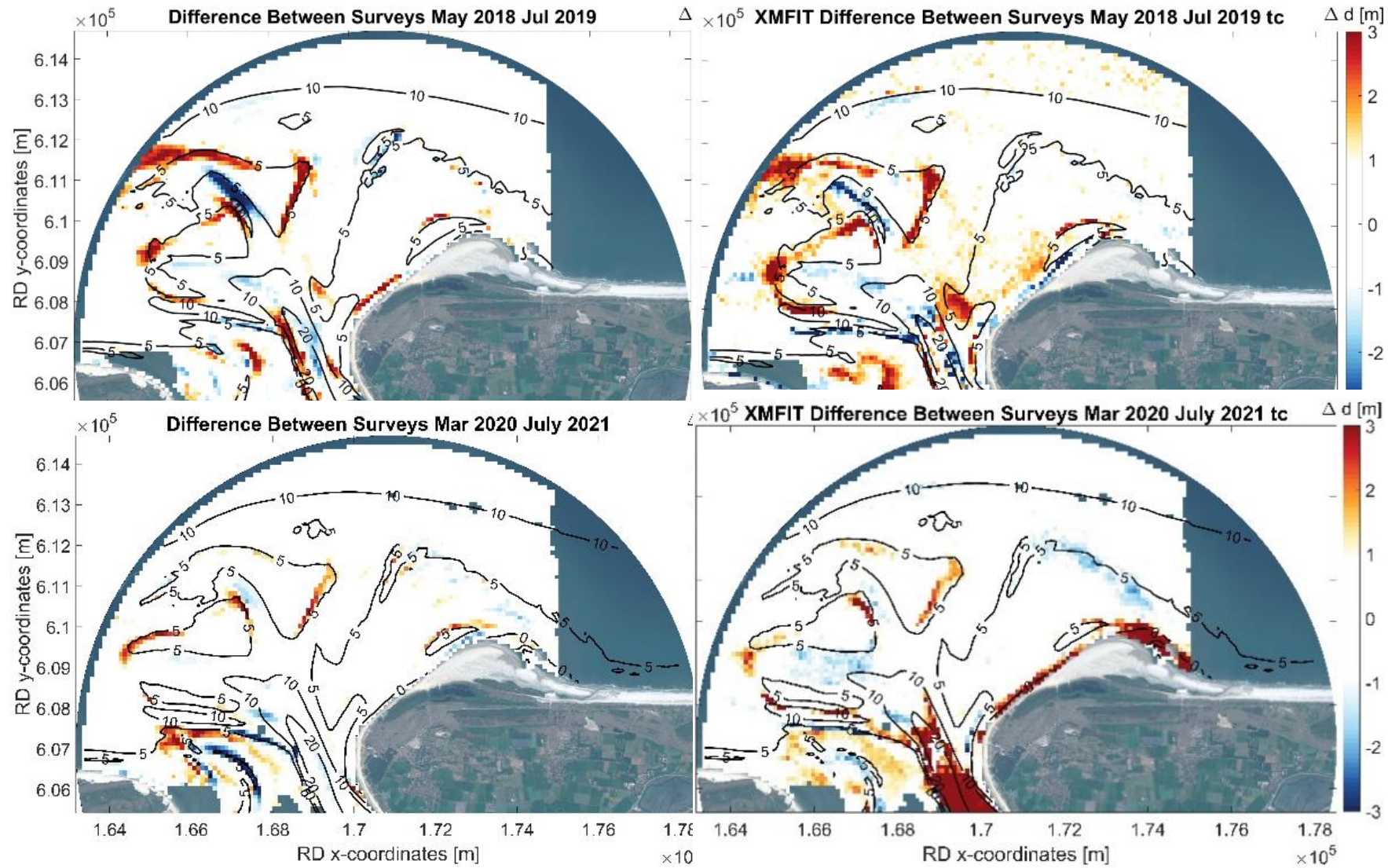
Suppletie

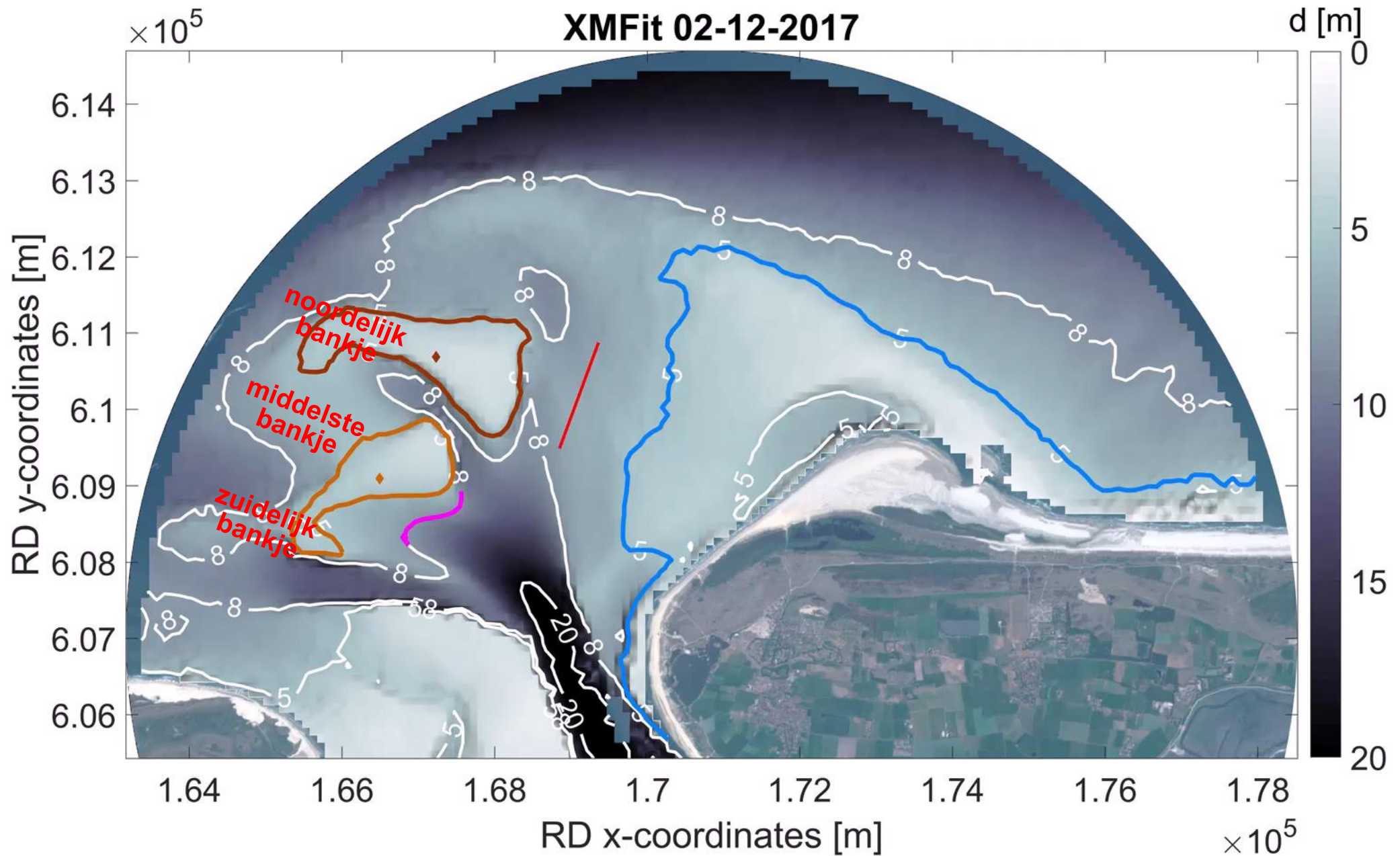


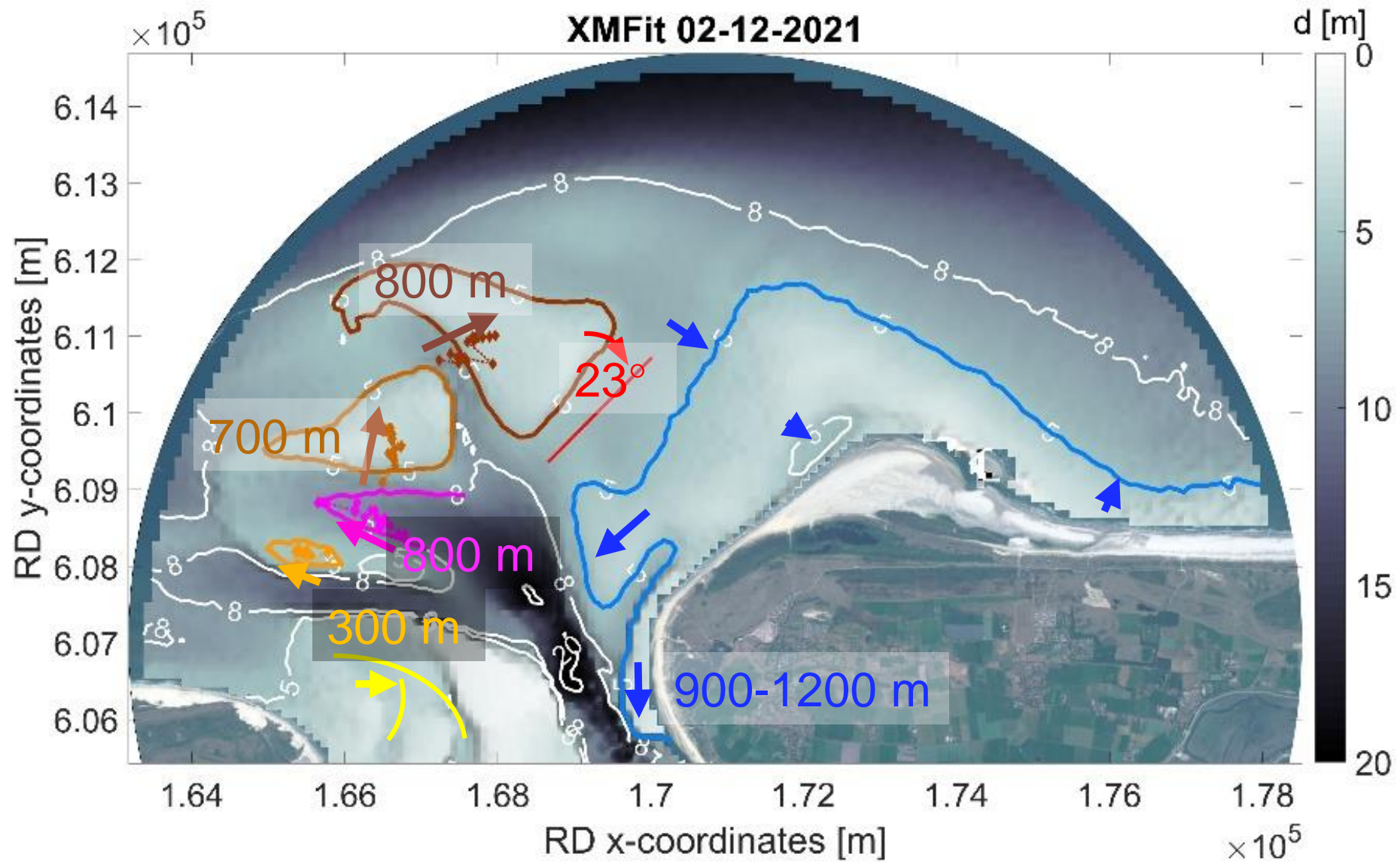


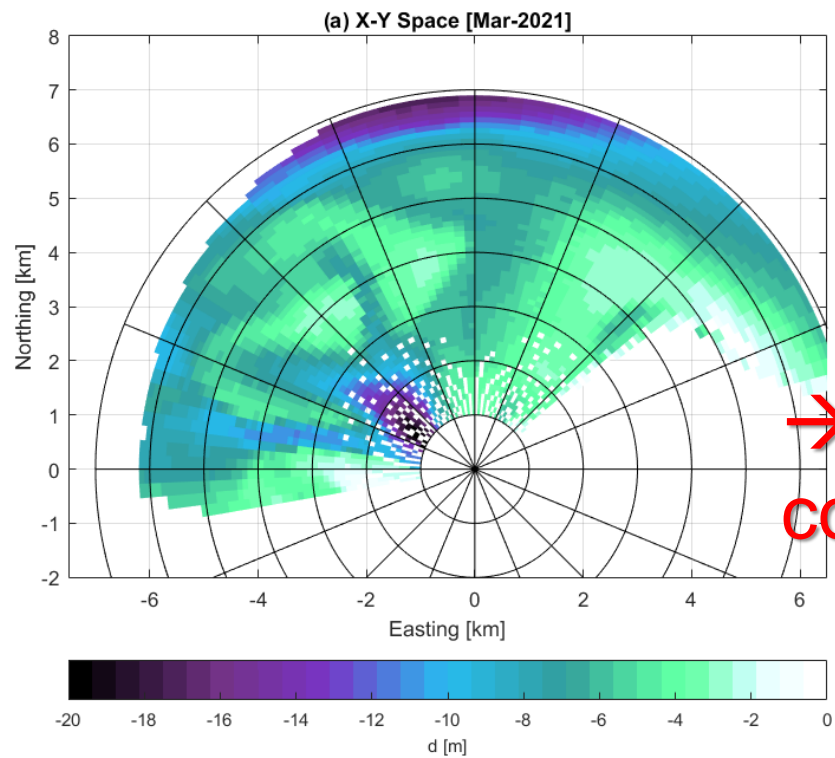
Wat deed de buitendelta?



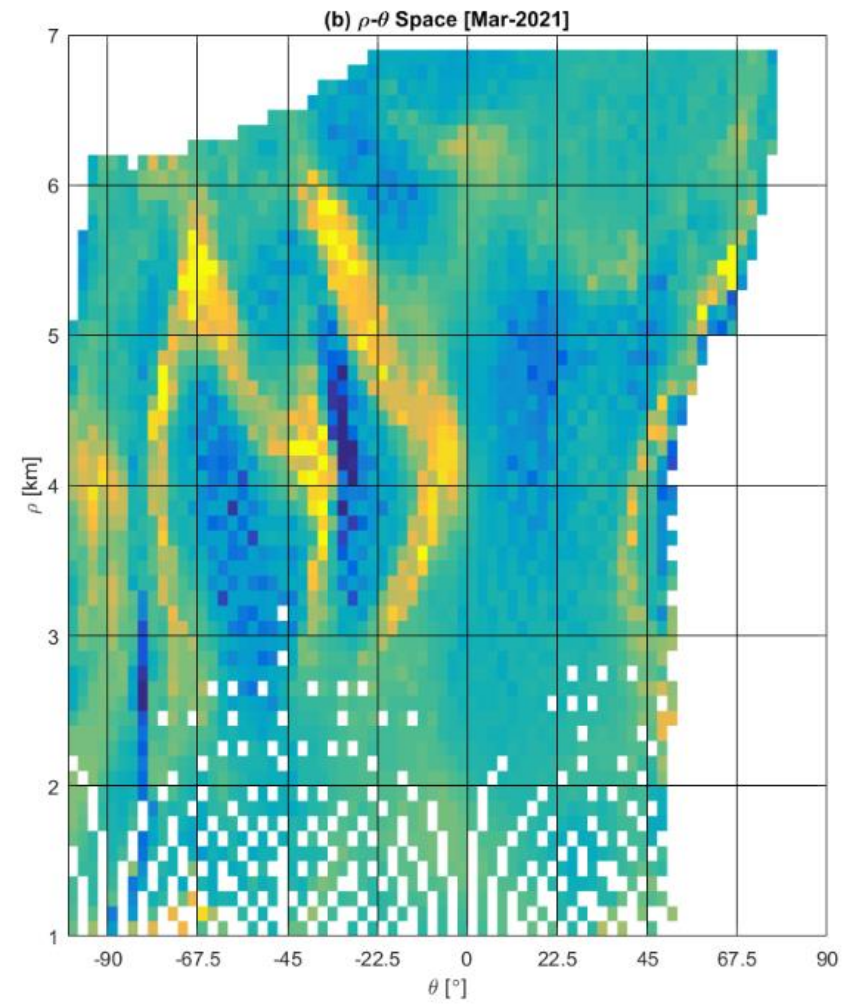
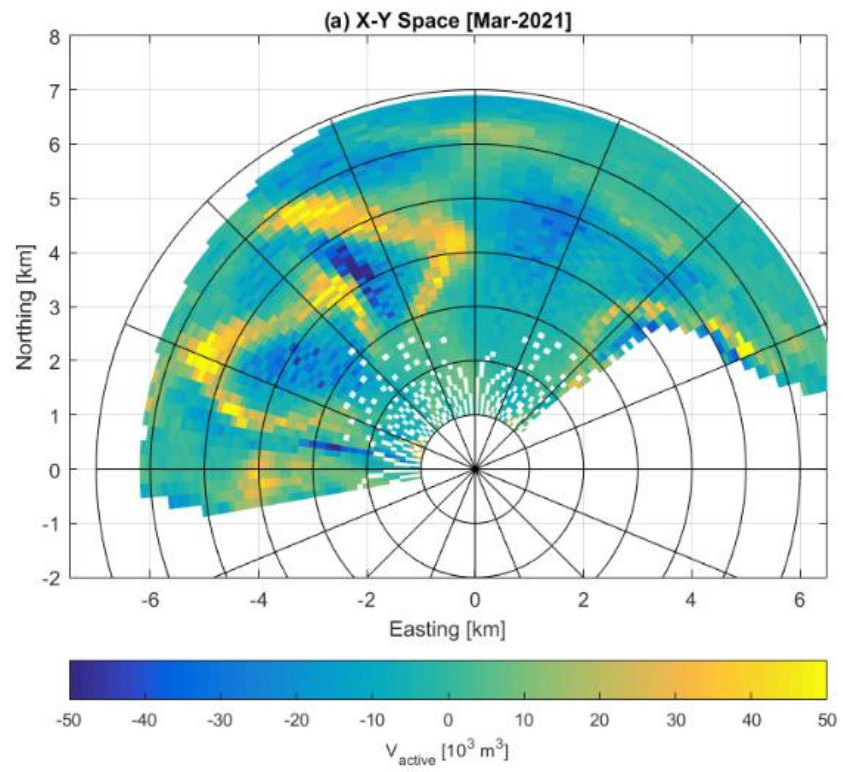


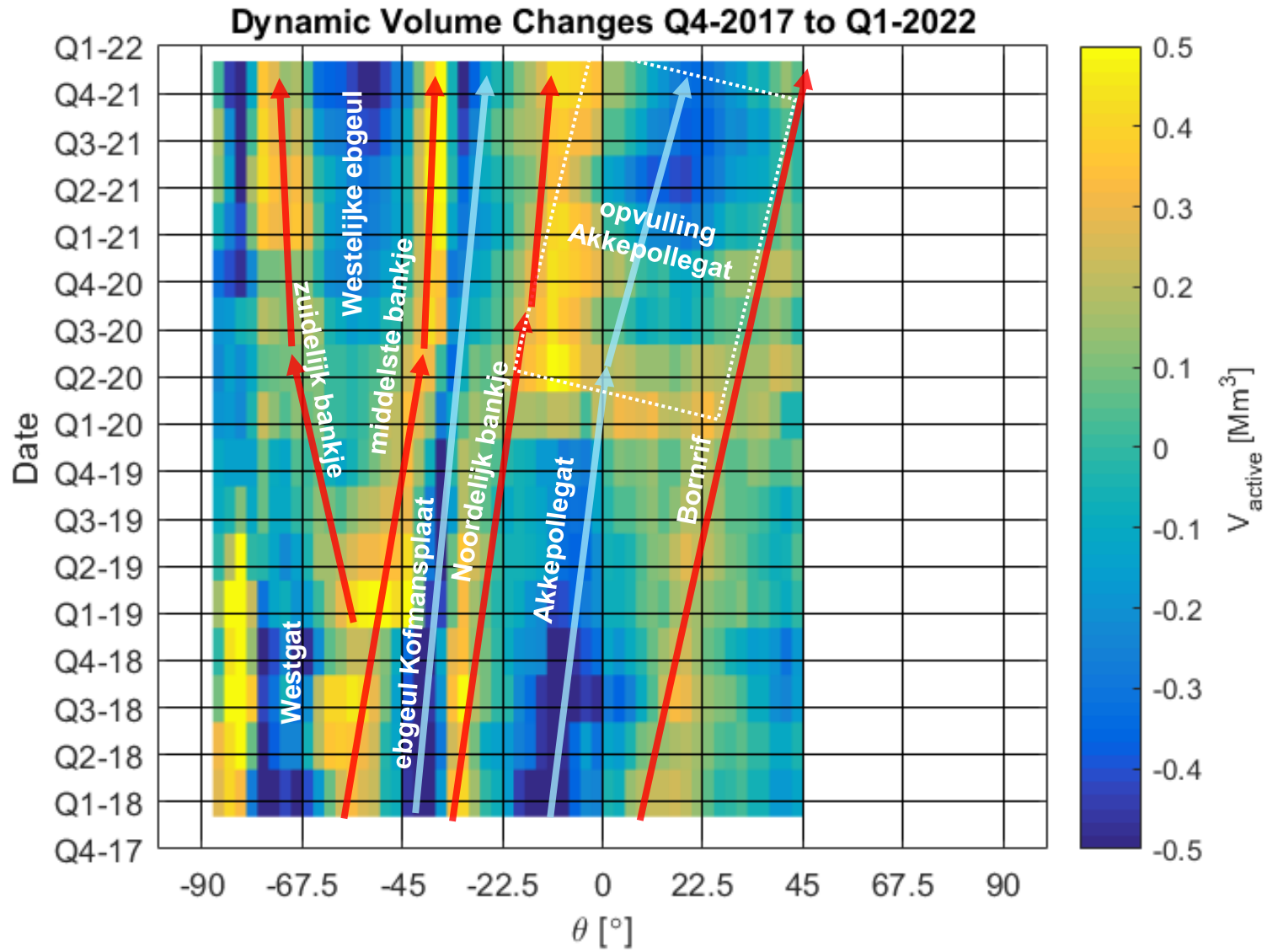






→ Polaire
coördinaten

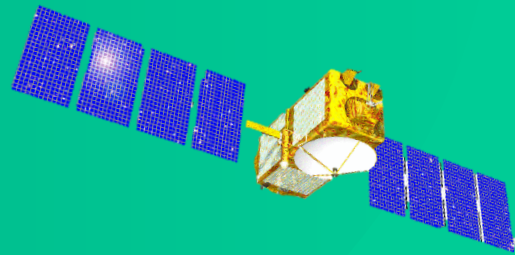


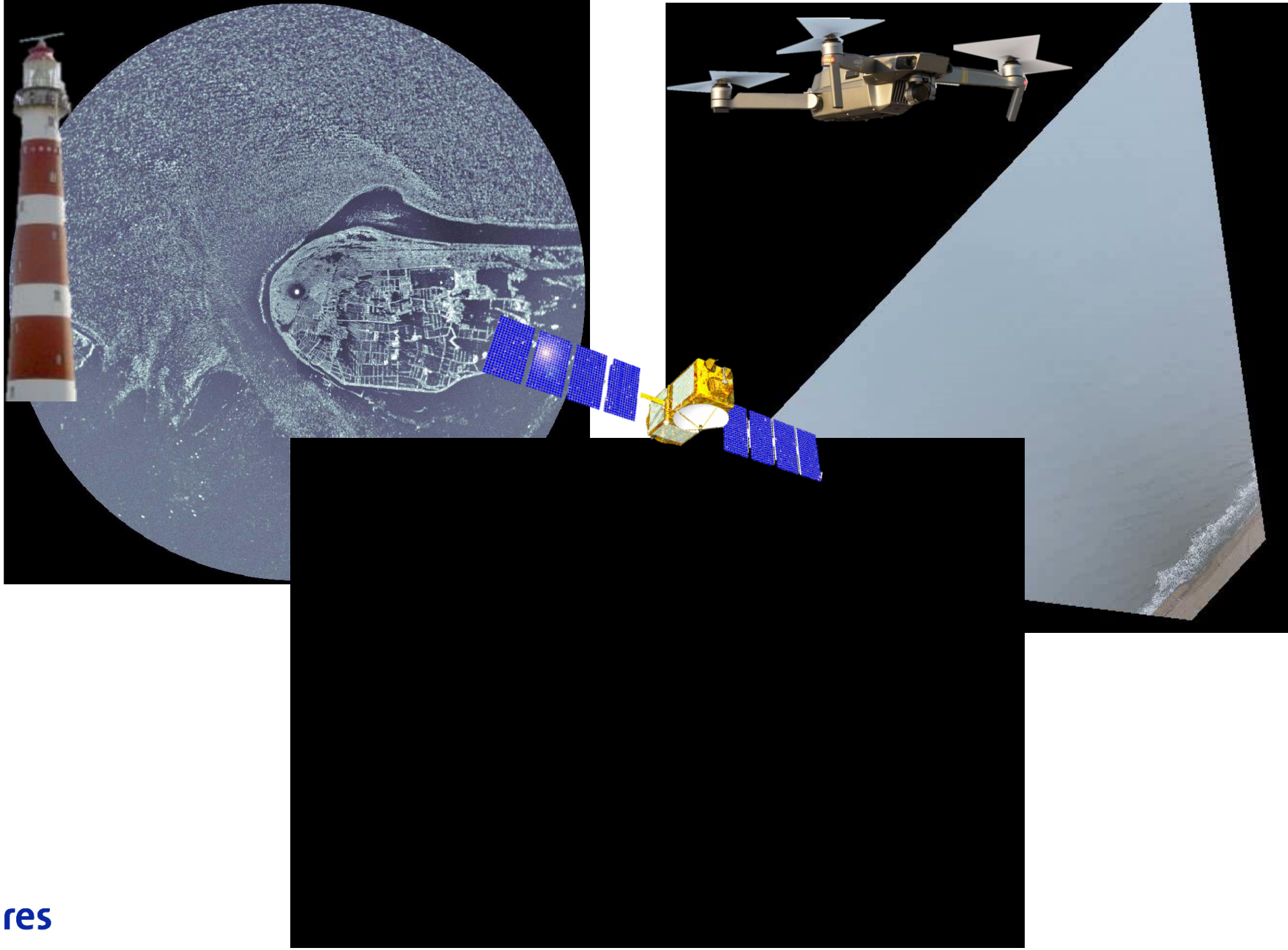


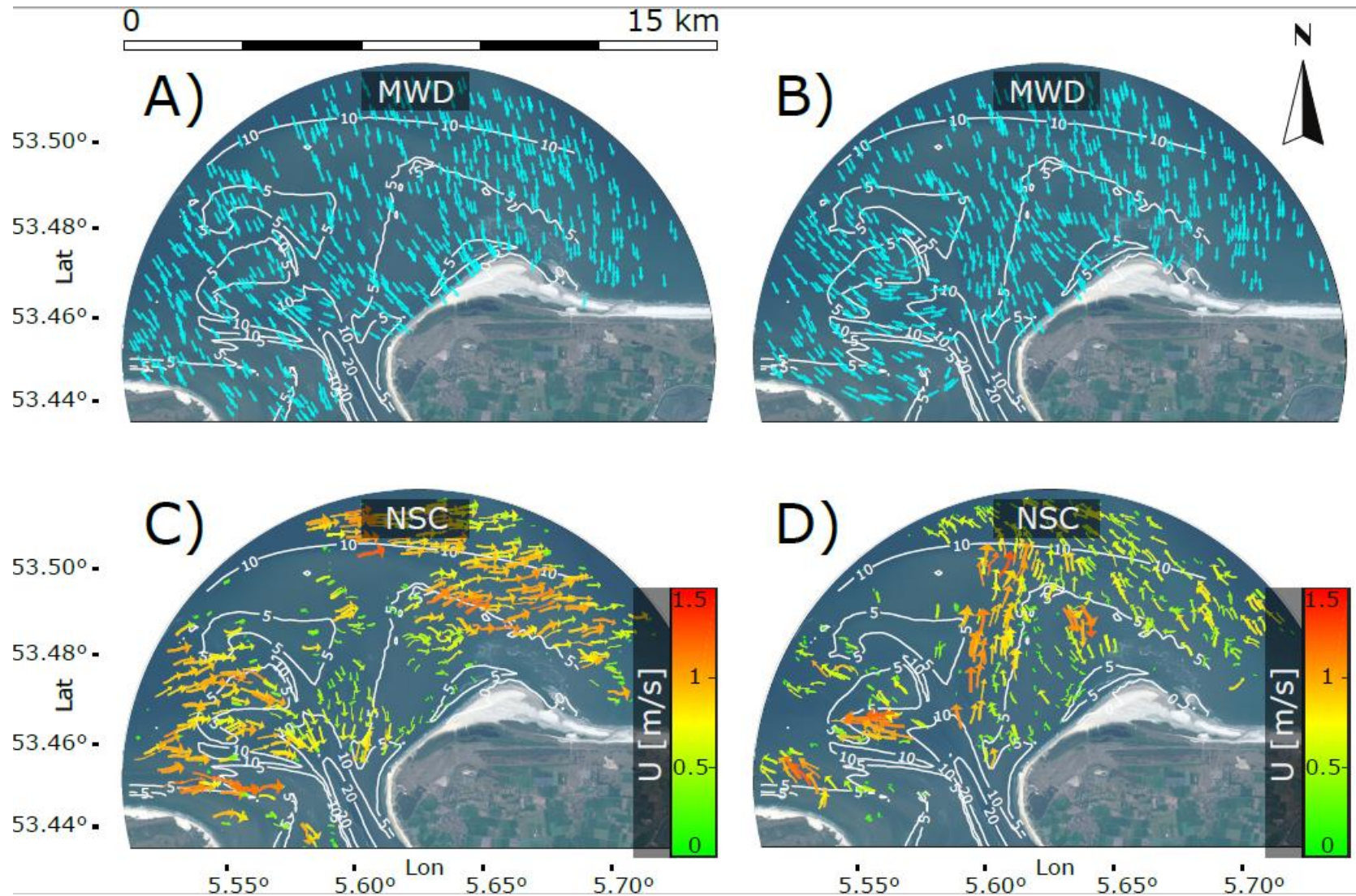
Conclusies

- XBand radar analyse met XMFit is een succesvolle monitoring tool
- Nauwkeruigheid XMFit schattingen (na codeverbetering) $< \pm 1$ m
- Pilotsuppletie kon worden gemonitord
- Veranderingen in de buitendelta konden worden gemonitord:
 - Uitbouw van westelijke ebgeul (8 m contour) met 1200 m
 - Zandbanken verschoven met 700-800 m en roteerden $\sim 20^\circ$ - 30°
 - Oude Akkepollegat roteerde en de rotatie lijkt te versnellen
→ Westelijke ebgeul wordt nieuwe Akkepollegat
 - Bornrif roteerde en landt aan bij Ameland
 - Hoge tijdresolutie maakt het mogelijk om onvoorspelbaar gedrag waar te nemen

Er kan nog veel meer







Drone analysis

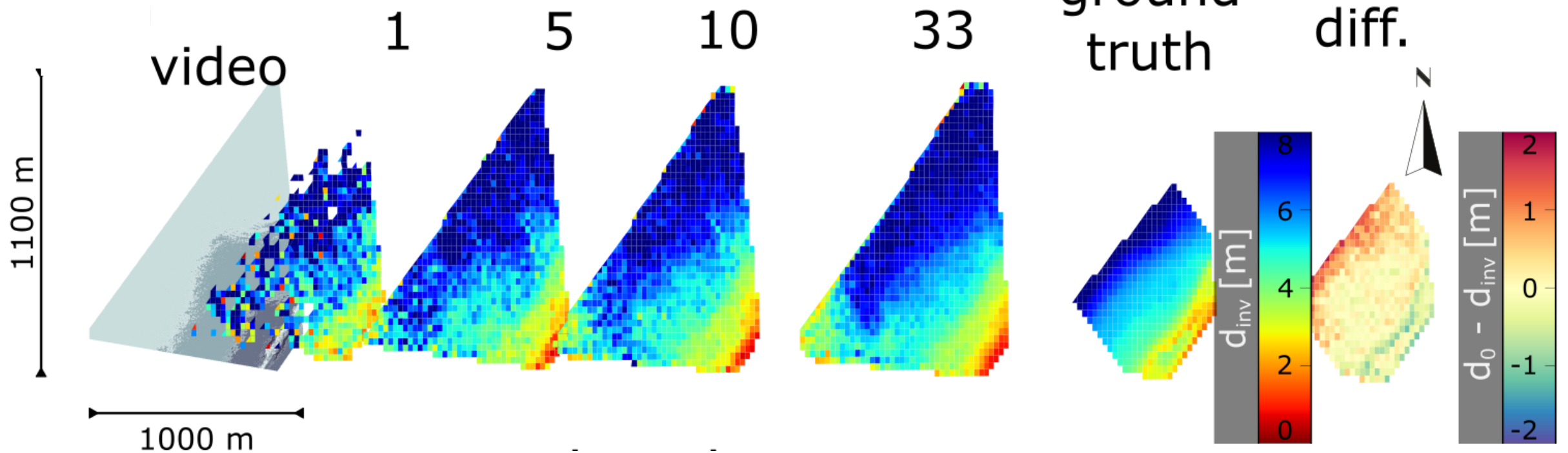


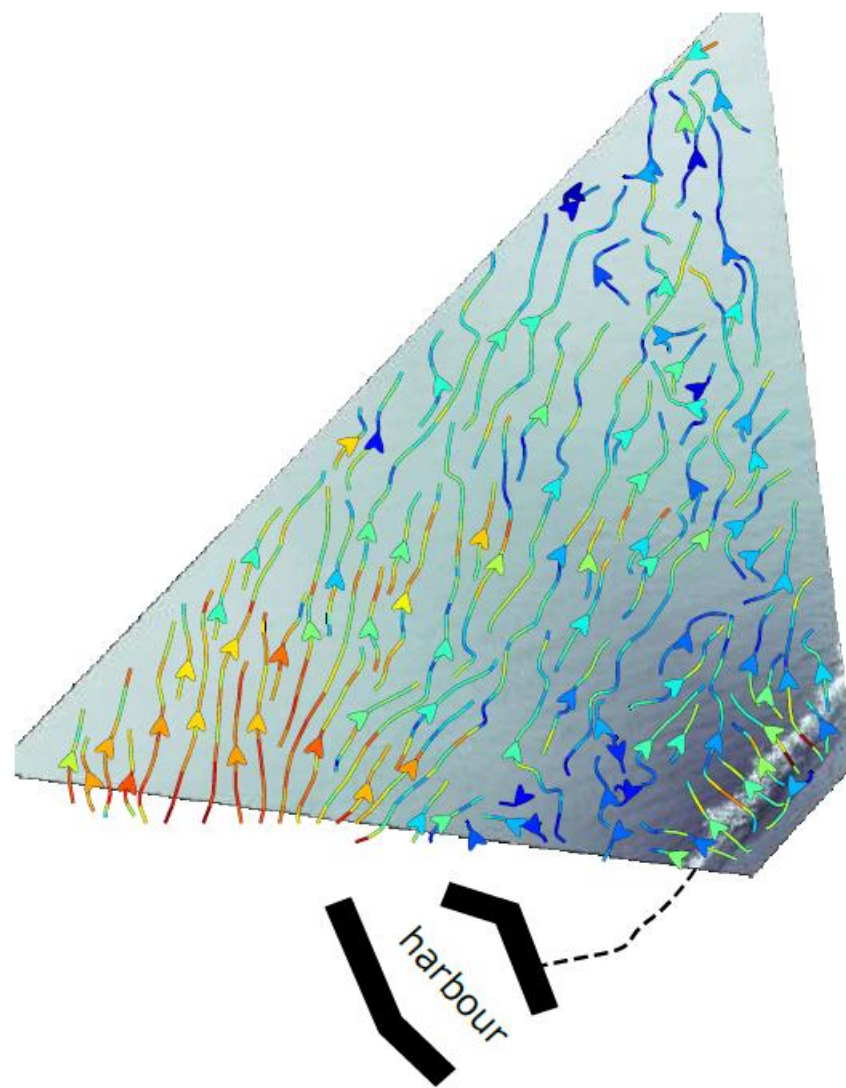
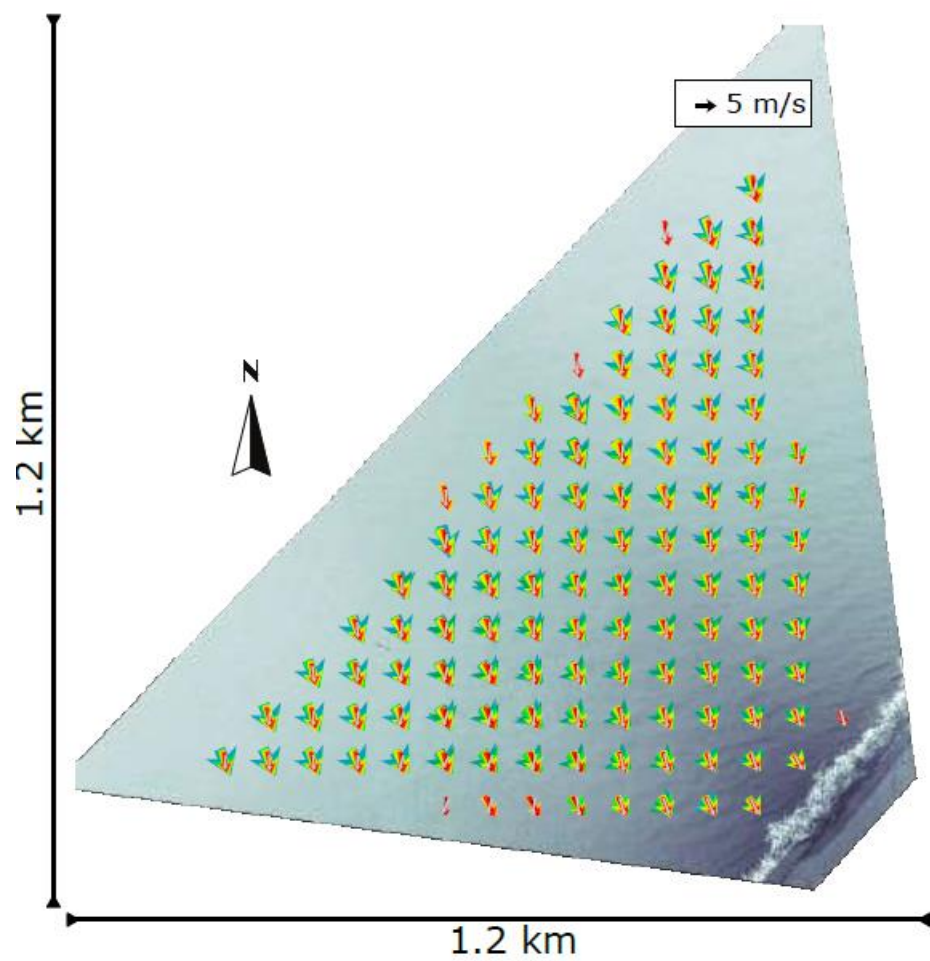
gcp tracking using computer vision...



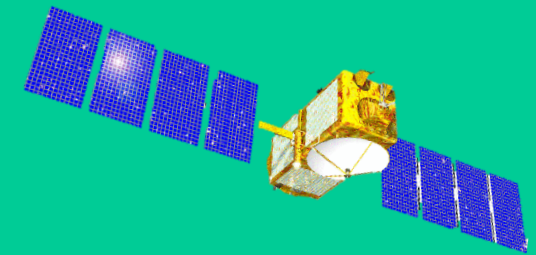


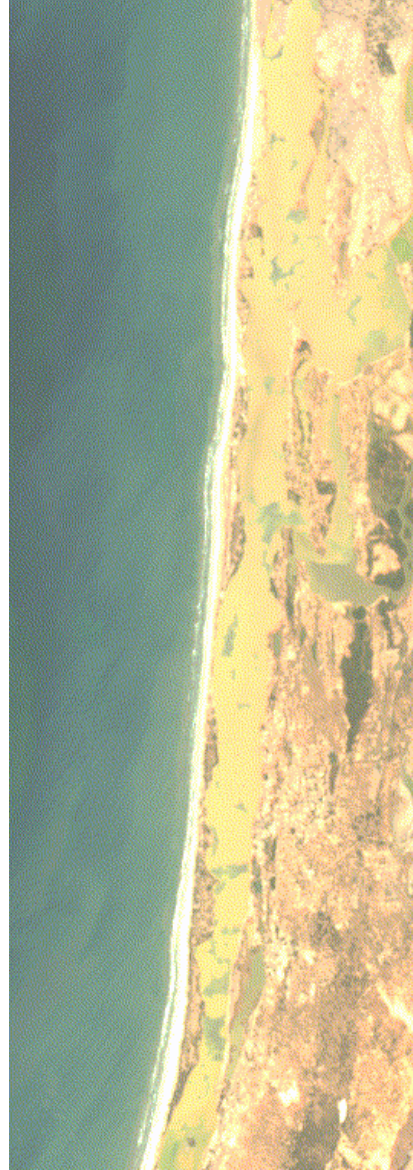
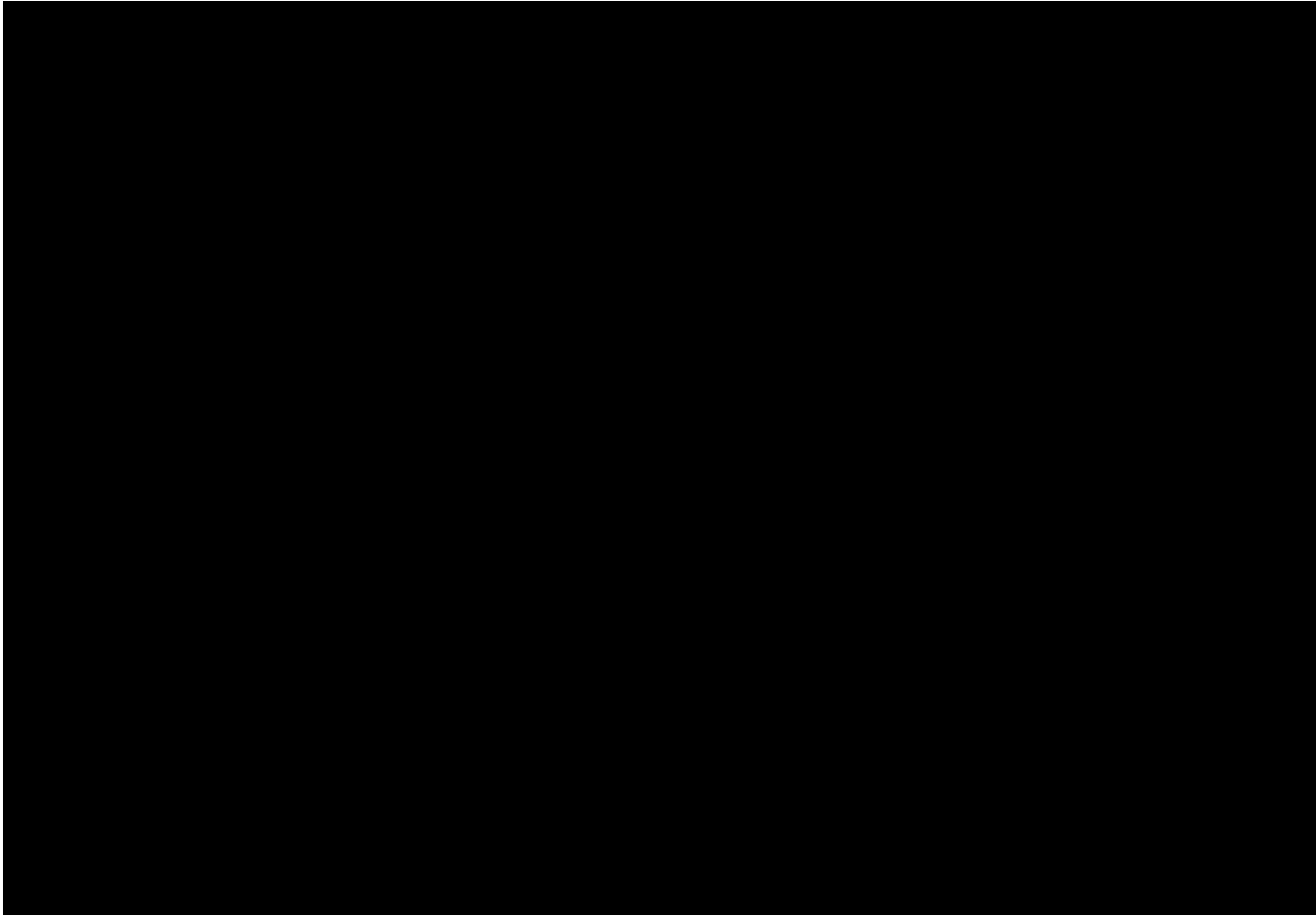
Software: COCOS





Satellite analysis





Deltares

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