

InSAR and Geodetic Reference Systems

Ramon Hanssen

EUREF Tutorial, Amsterdam, 29-05-2018



Challenge the future 1

Contents

Afternoon session: InSAR and Geodetic Reference Systems

14:00	14:25	Datum connection and integration of techniques	prof. Ramon Hanssen (NCG/TUD)
14:30	14:55	Geodetic infrastructure: Transponders and Reflectors	dr. Hans van der Marel (TUD)
15:00	15:25	Practical experience: case study Groningen	dr. Gini Ketelaar (NAM)
15:30	16:00	Coffee break	
16:00	16:30	Transponders for operational practice	dr. Adriano Meta (MetaSensing)
16:30	17:00	Practical experience: maintaining the Dutch Vertical Reference System	Dr. Bas Alberts (RWS)
17:00			



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InSAR datum connection and integration of techniques

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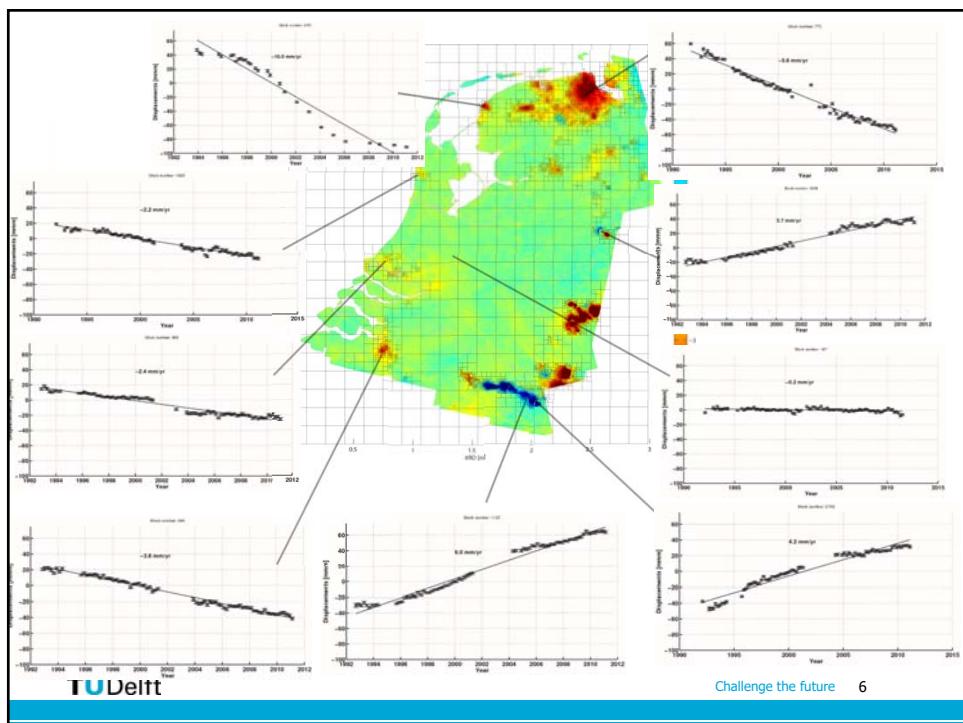
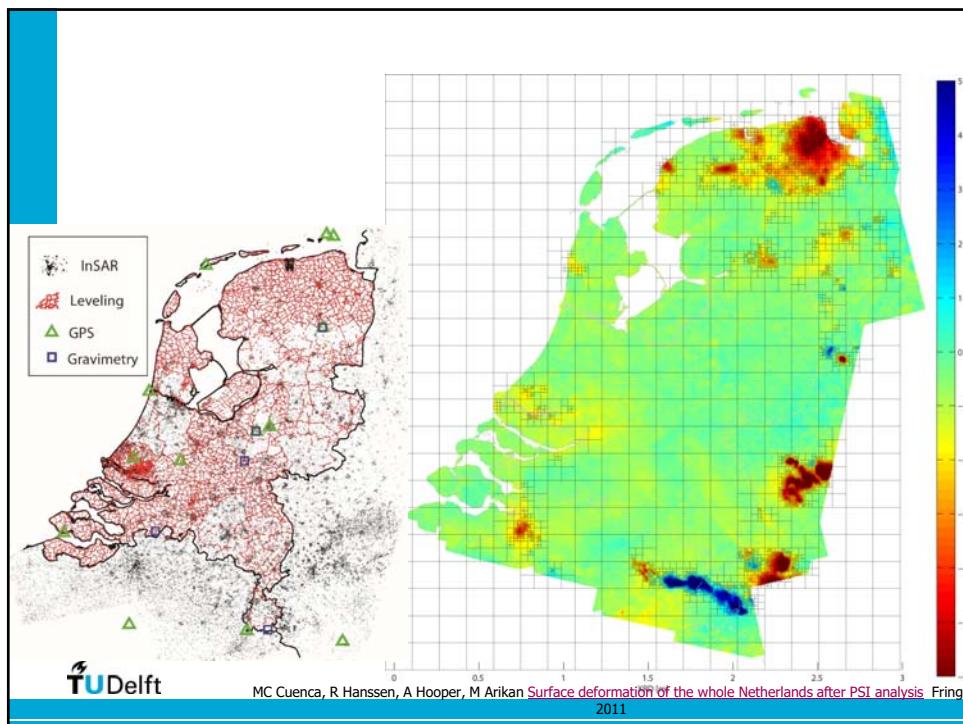


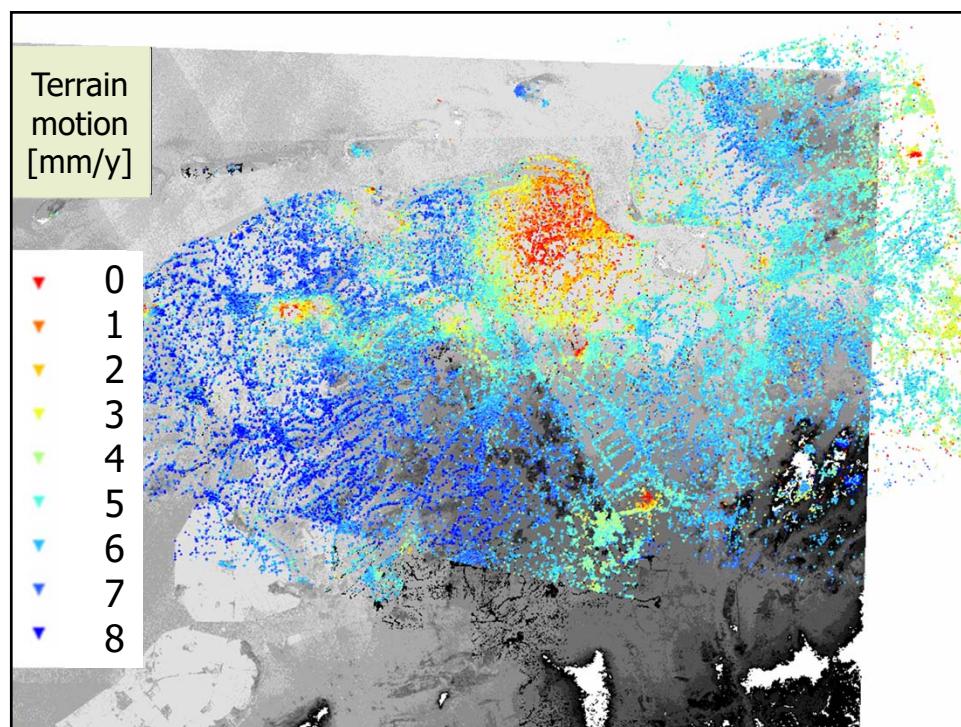
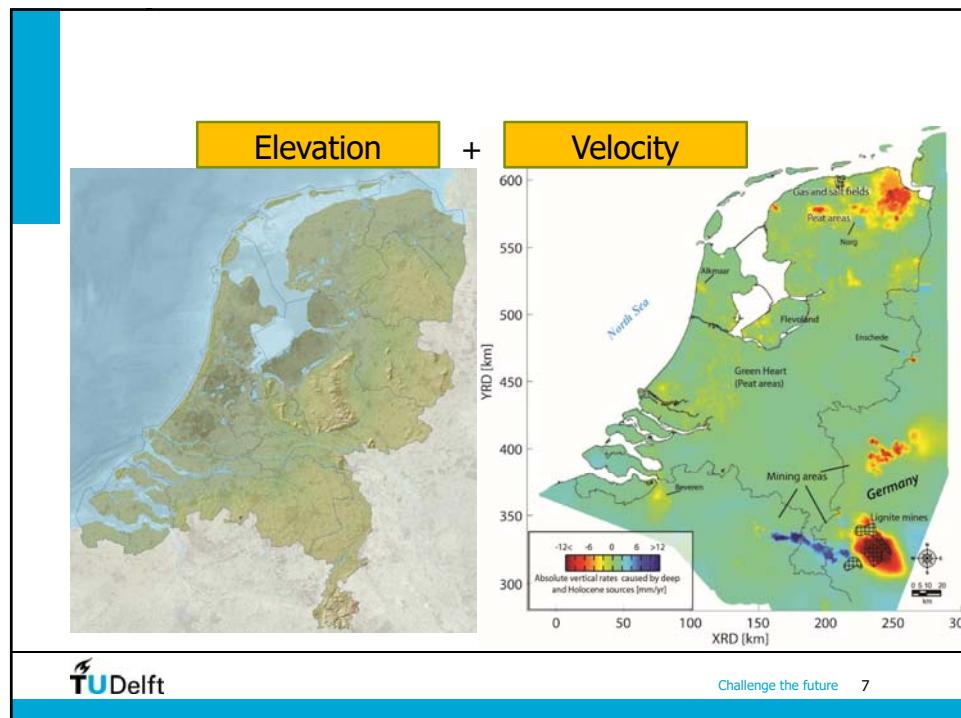
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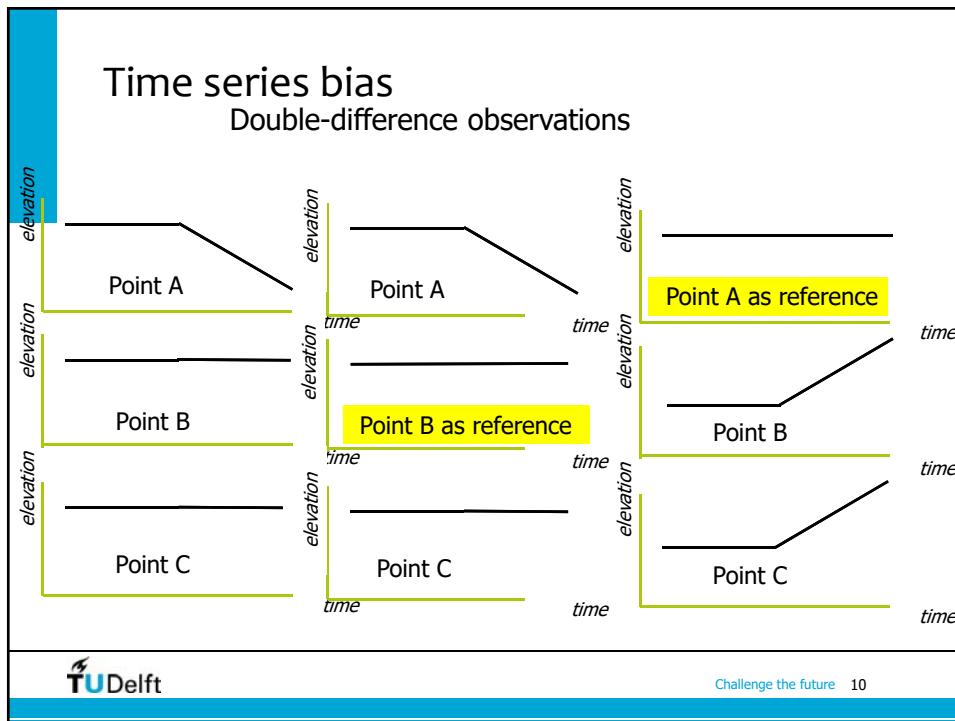
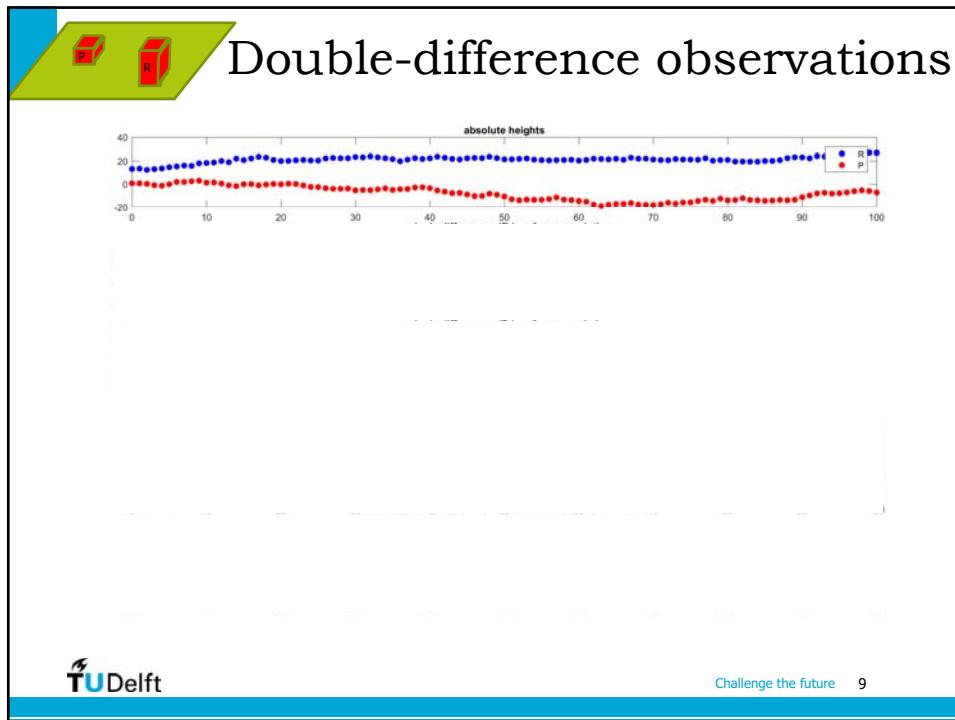
Geodesy: Datum Connection

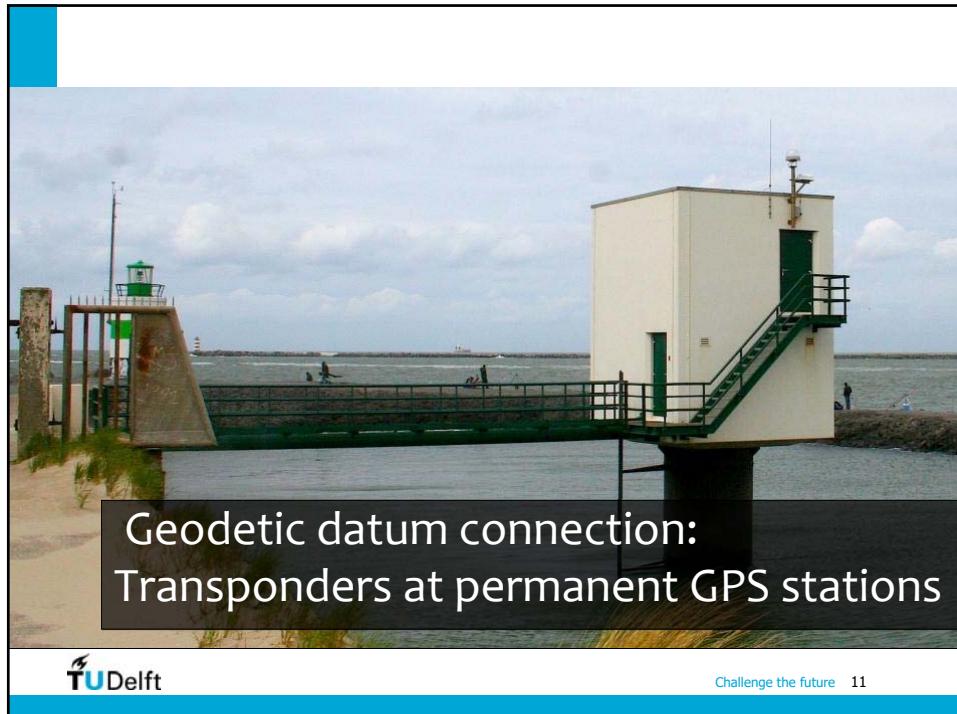


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Geodetic datum connection:
Transponders at permanent GPS stations

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‘Absolute’ InSAR velocities

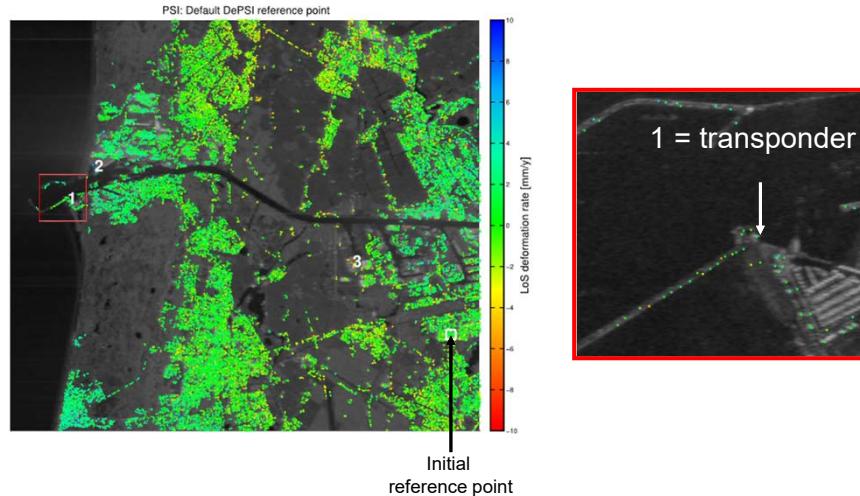
- Transponders mechanically connected to GPS stations



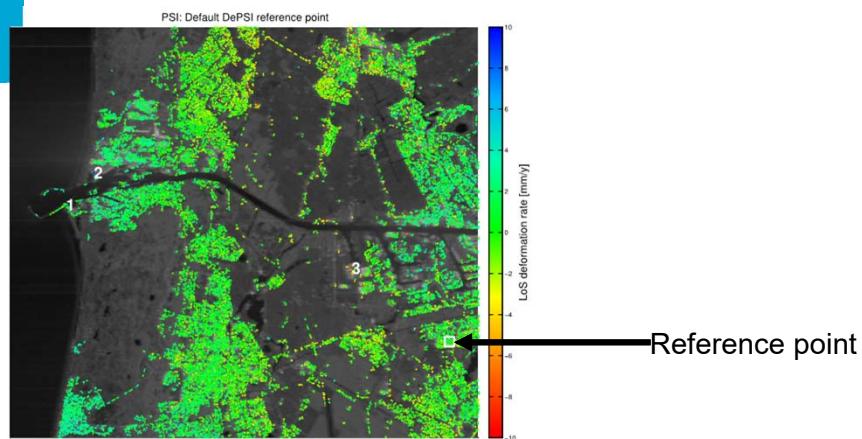
TU Delft

Mahapatra, P. S.; Samiee-Esfahany, S.; van der Marel, H. & Hanssen, R. F., On the Use of Transponders as Coherent Radar Targets for SAR Interferometry, IEEE Trans. On Geosci & Rem Sens 2014;52, 1869 - 1878

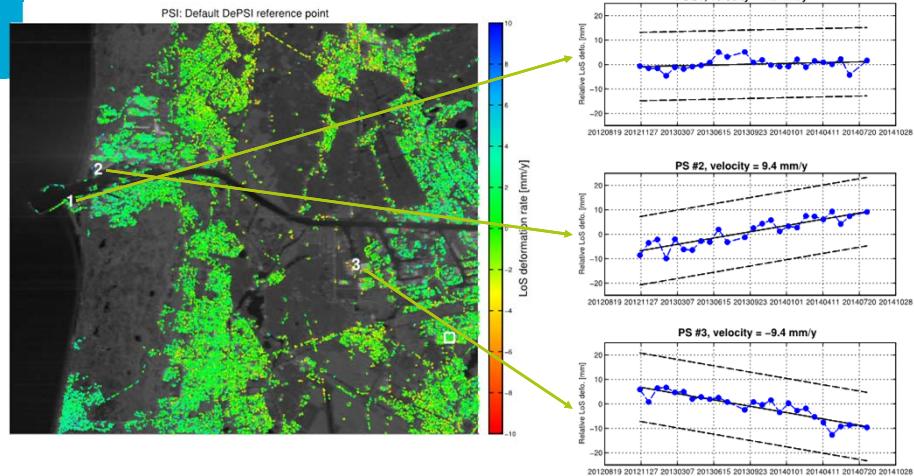
Geodetic datum connection



The standard approach

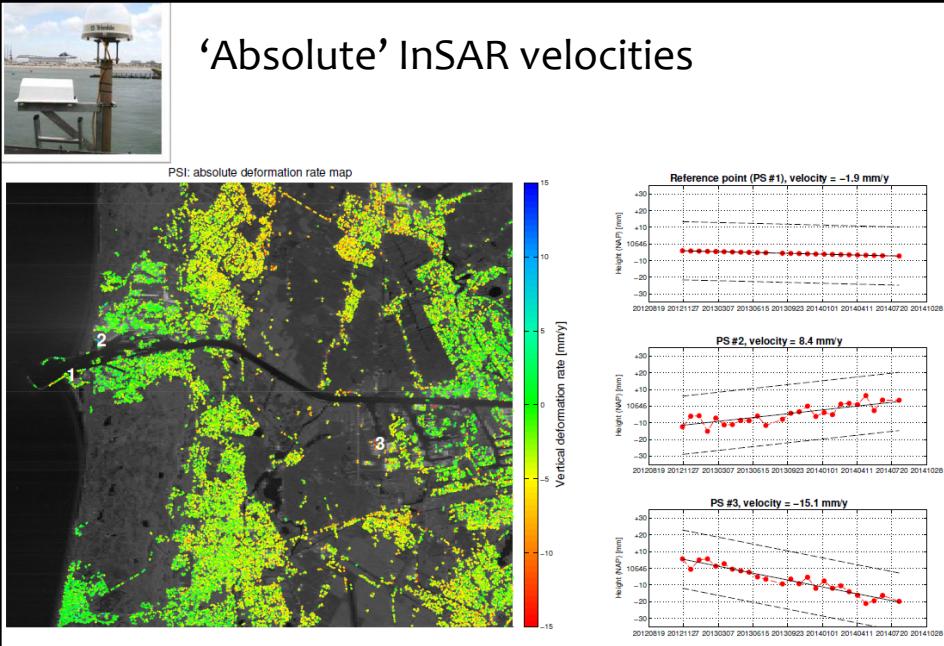


InSAR deformation estimates are relative



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'Absolute' InSAR velocities



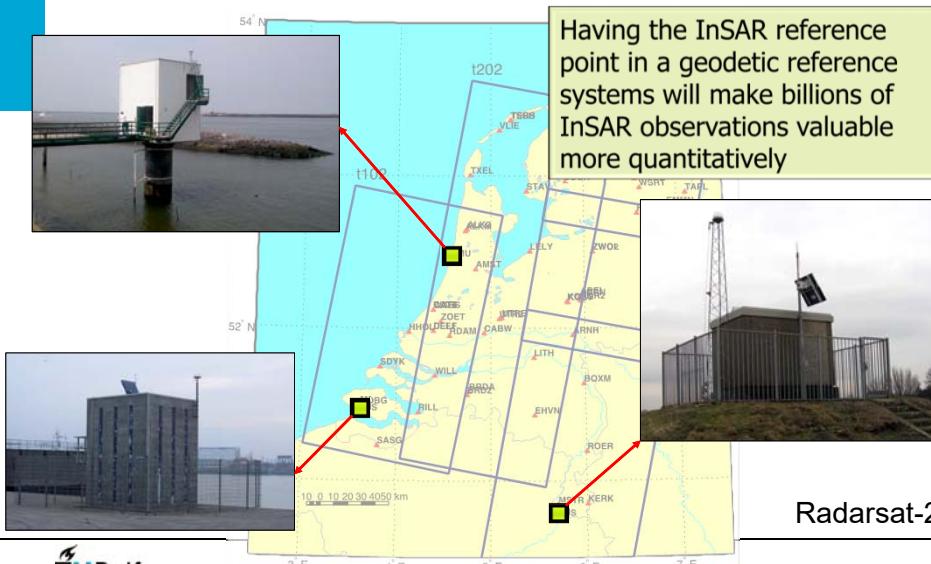
Mahapatra, P., Van der Marel, H., Van Leijen, F., Samiei-Esfahany, R., Klees, R. and R.F. Hanssen

Connecting InSAR to a Global Geodetic Datum, *IEEE Trans. Geosci. Rem Sens.*, 2016, Challenge the future 16

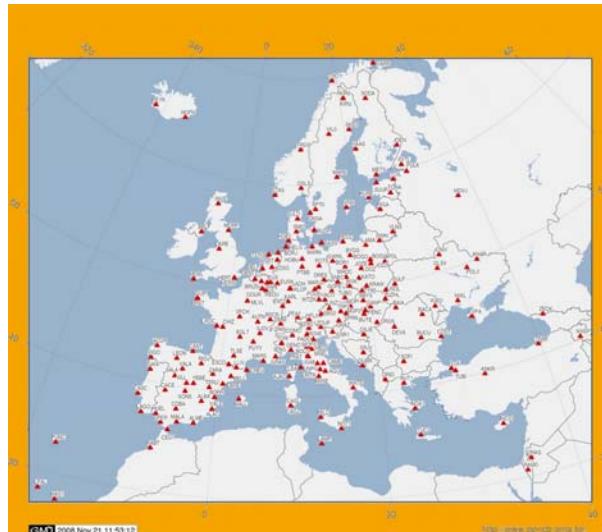
'Absolute' motion of large areas



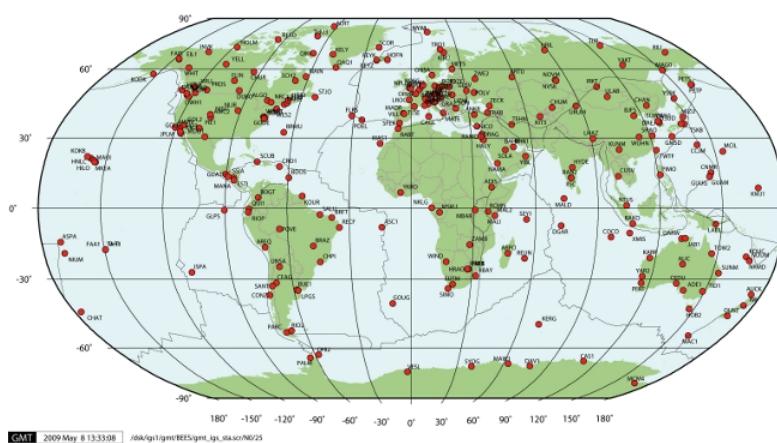
The outlook: operational systems



Upscaling to Europe (EUREF)



Upscaling: IGS network



Metasensing transponders: “Electronic Corner Reflectors”



Integrated Geodetic Reference Stations



<http://www.bodemdalingskaart.nl>



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