



Land Monitoring

A first appraisal of the European Ground Motion Service

SOLARI L., Crosetto M., Balasis-Levinsen J., Bateson L., Casagli N., Commerci V., Guerrieri L., Frei M., Mróz M., Moldestad D.A., Oyen A., Andersen H.S.



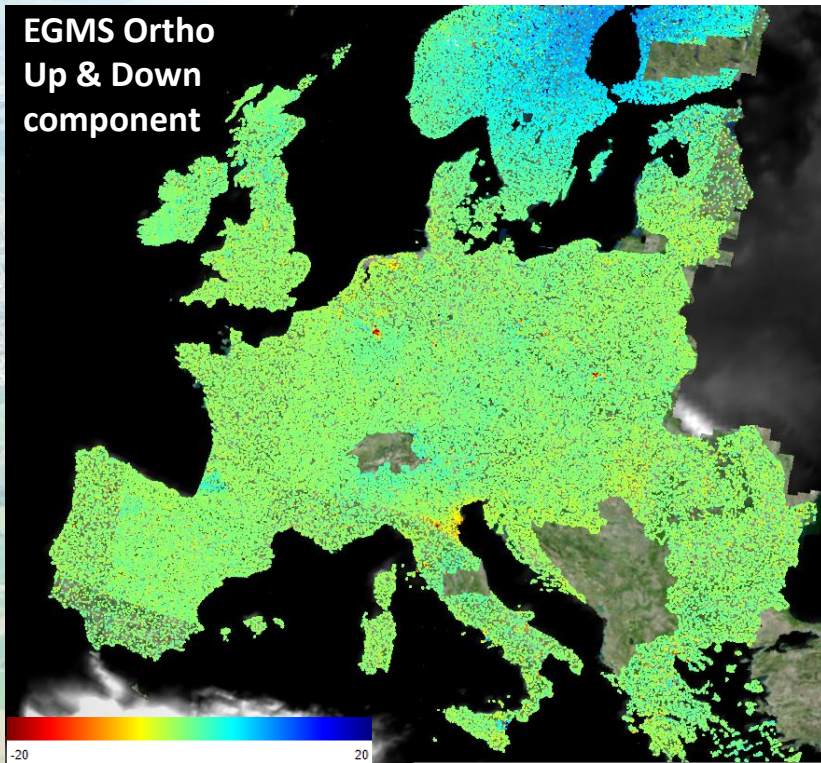


Land
Monitoring

EGMS is ready!

EGU General Assembly 2022

EGMS Ortho
Up & Down
component



To view the products:

<https://egms.land.copernicus.eu/>

To learn about the products:

<https://land.copernicus.eu/pan-european/european-ground-motion-service>

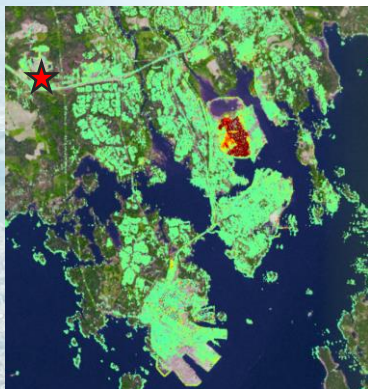
The first EMGS release gives users access to the ORTHO product – the full product portfolio and download will be available by the end of June 2022



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EGMS levels & their usage

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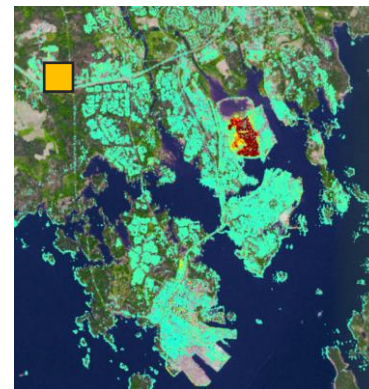
EGMS Basic

- The “classic” InSAR product
- LOS velocities referred to a local reference point
- Relative data
- Usable for investigations at the frame level

Calibration process
GNSS model from thousands of
stations around EU

EGMS Calibrated

- LOS velocities anchored to a GNSS reference frame
 - Absolute data
- Contains large scale signals
- Can be seen as a seamless layer over Europe



EGMS Ortho

- Components of motion E-W & U-D
- Resampled but easier to “read”
- Fundamental for non-vertical phenomena

Resampling of asc & desc orbits
to squeeze the information

European Environment Agency



European
Commission

Copernicus
Europe's eyes on Earth

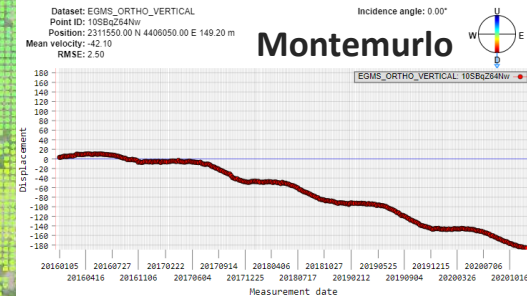
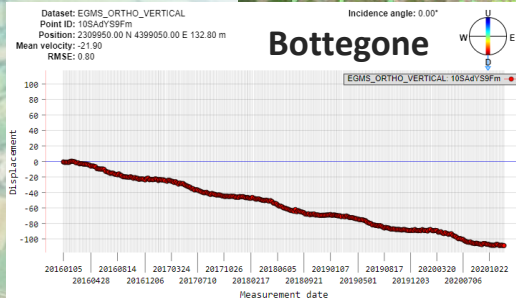
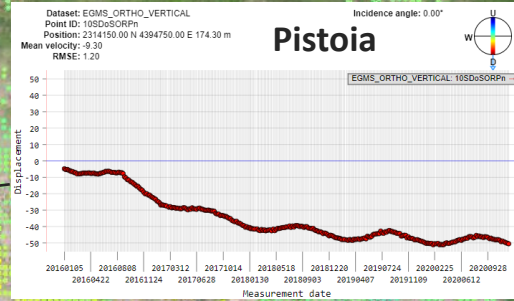
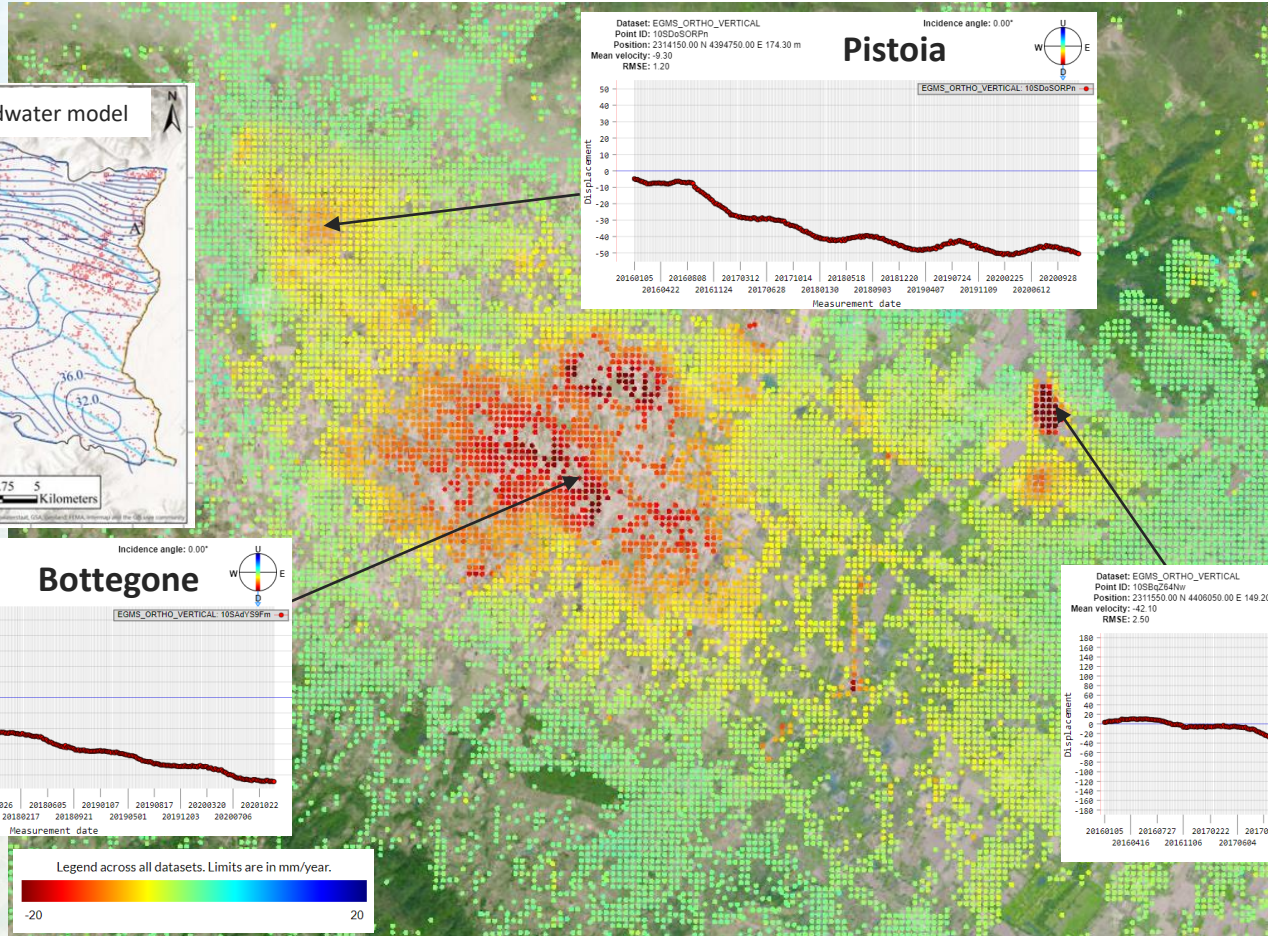
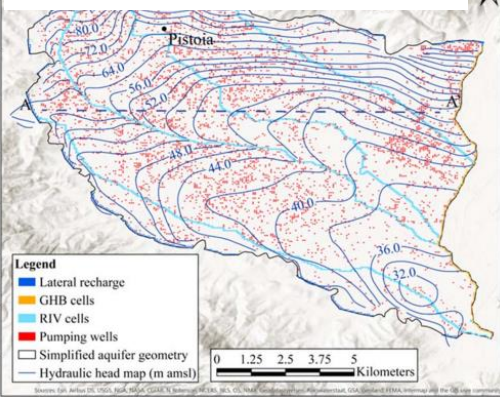


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Subsidence in Italy

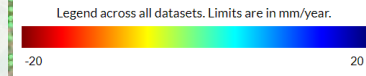
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Ceccatelli et al., 2021 - Groundwater model



EGMS Ortho, Up
component –
Subsidence due to
water exploitation

Different patterns
& different
triggering factors



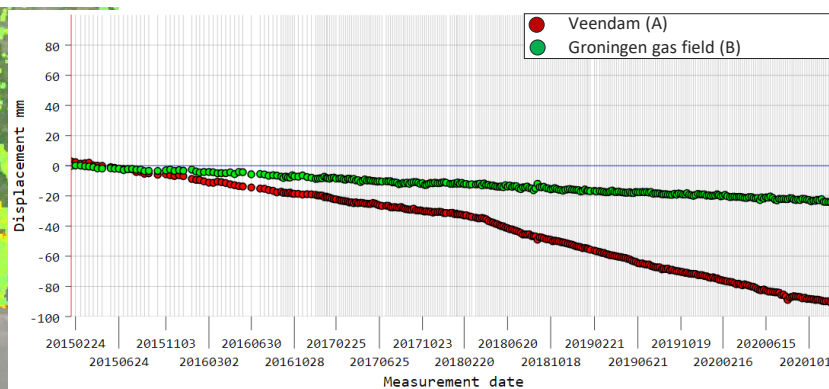
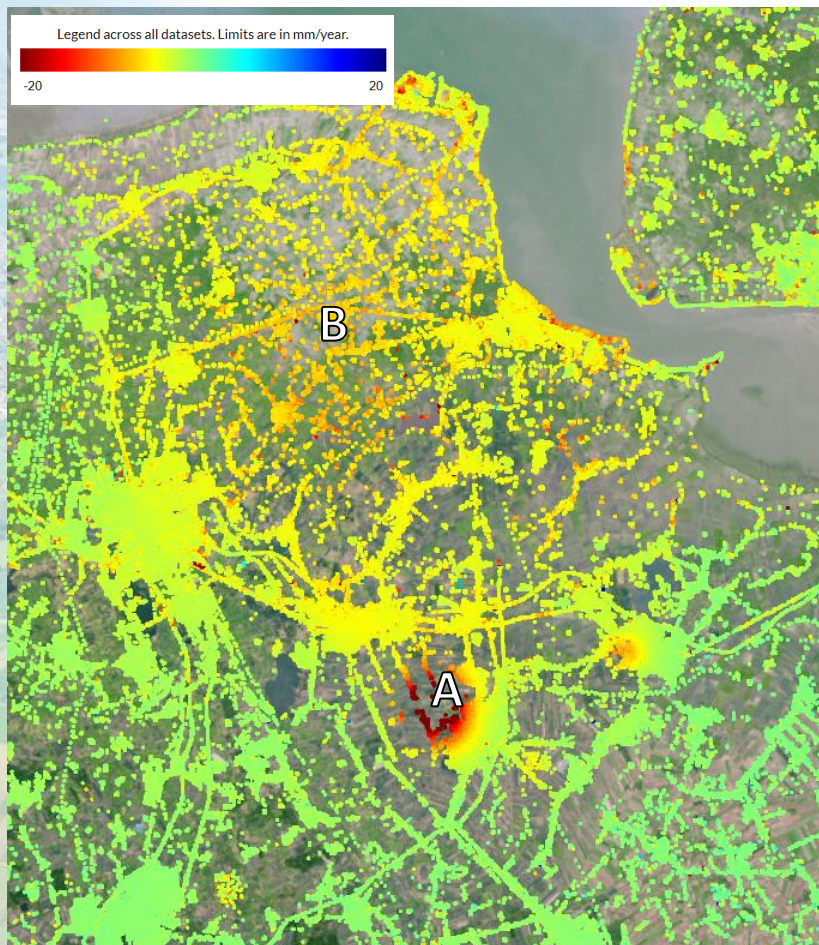
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Subsidence in The Netherlands

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EGMS Ortho – Up component

Descending orbit

A → Veendam salt solution mining

B → Groningen gas field

European Environment Agency



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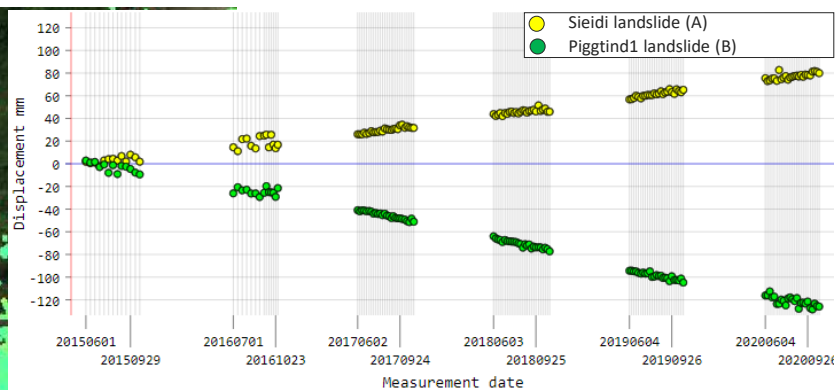
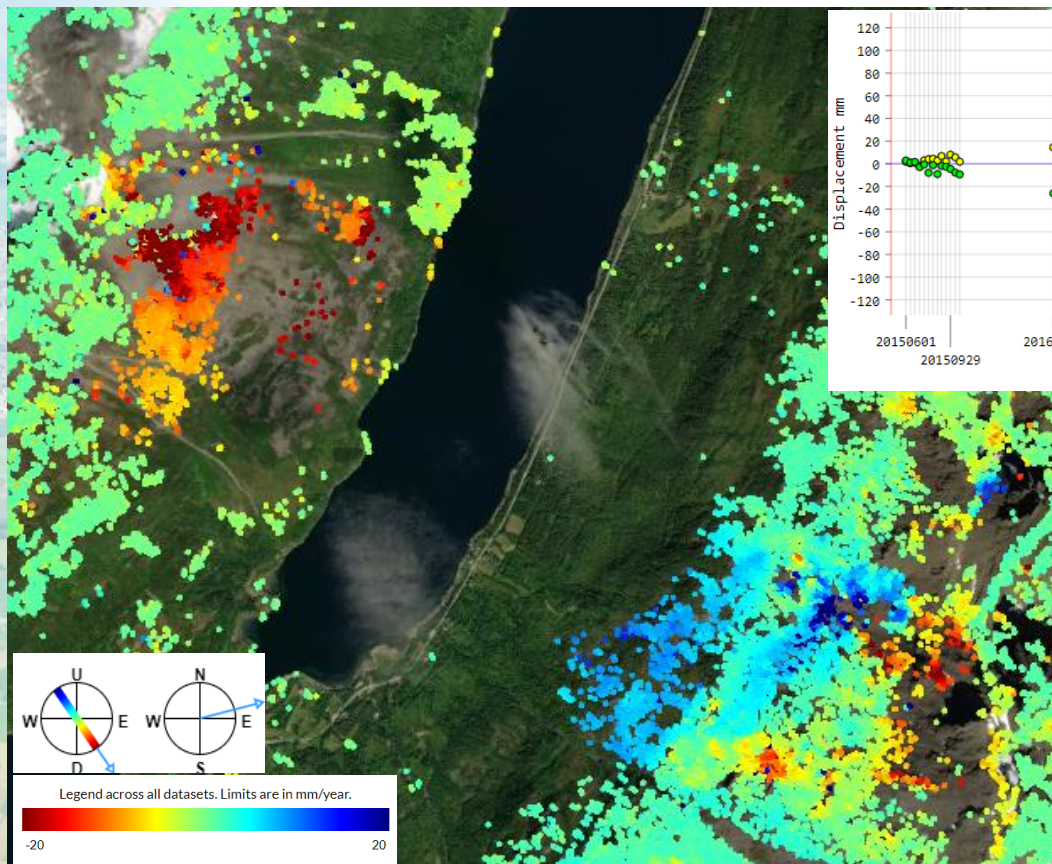
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Landslides in Norway

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EGMS Basic

Ascending orbit

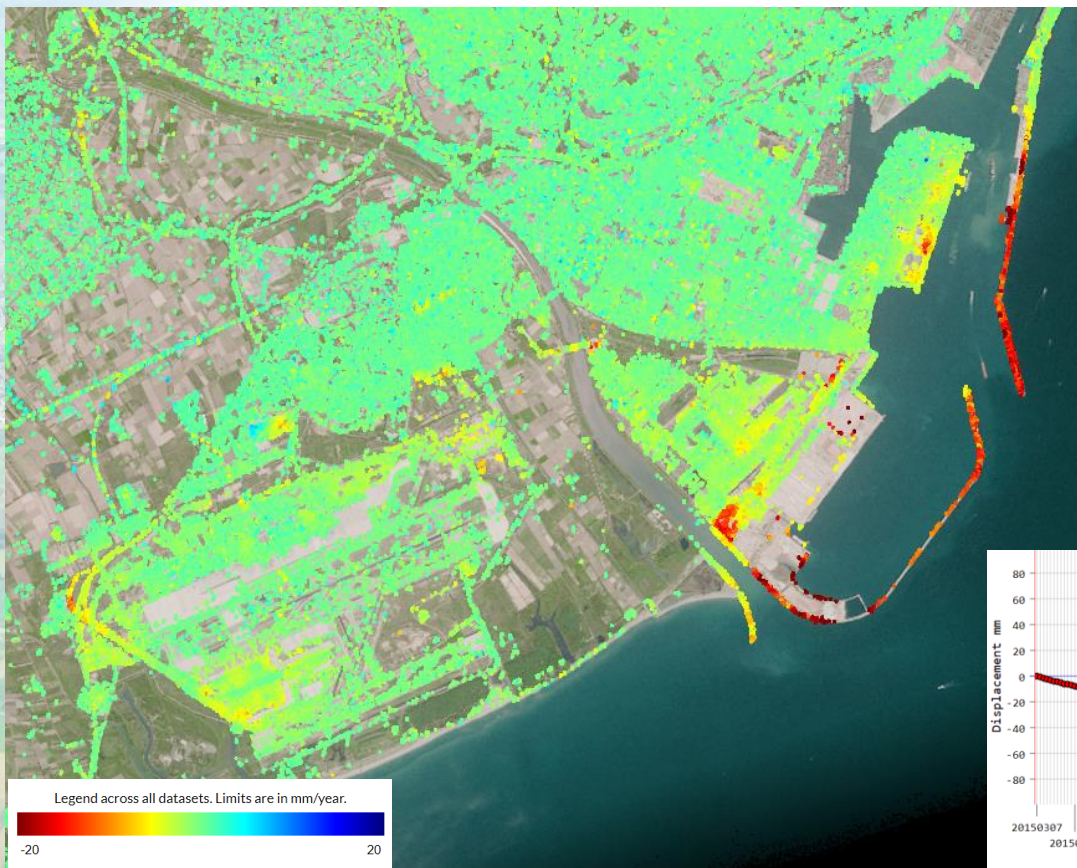
~6 months gaps due to
snow cover



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Infrastructure in Spain

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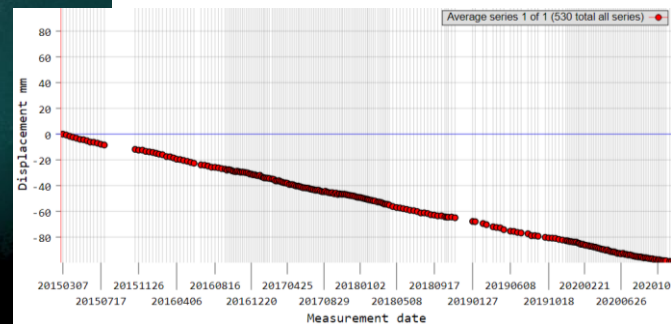
Legend across all datasets. Limits are in mm/year.



EGMS Calibrated

Ascending orbit

Ground motion in El Prat
airport & Barcelona
harbour



EGU GENERAL ASSEMBLY, MAY 2022

European Environment Agency

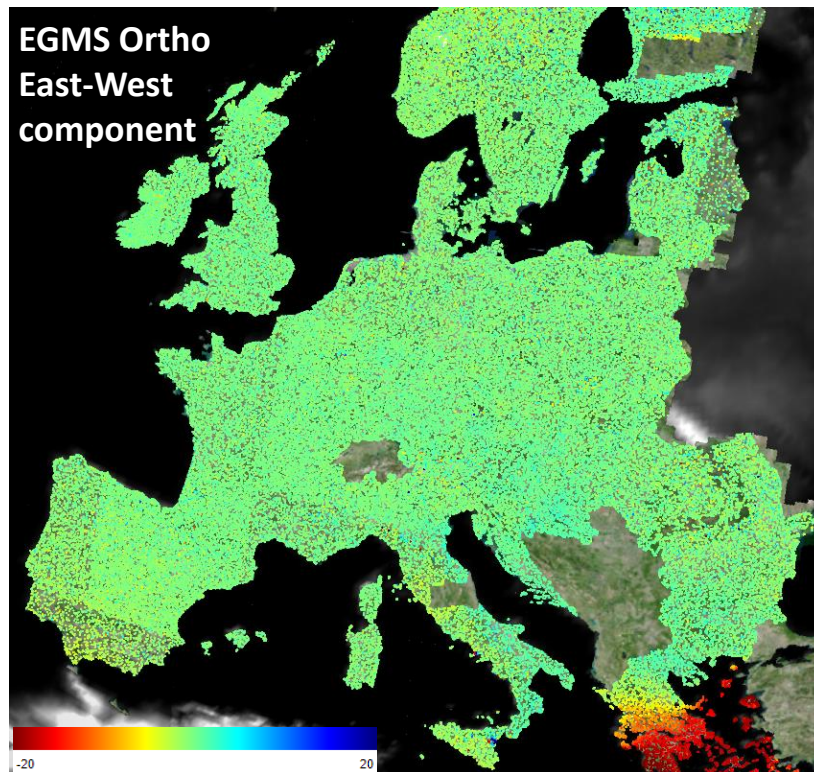


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- A new **European geospatial dataset** of unique value, from which other products/services can be developed
- Great opportunity for the geoscientific community to discover and learn
- Huge mapping capability – especially where inventories are not available
- Baseline for monitoring activities



Thank you!

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