

Remote Sensing and GIS as Key Technologies in Agricultural Information Systems

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RS Data in Agriculture



The potential is obvious:

- independent data from space ...
- covering huge areas everyday
- partly free of charge (e.g. Landsat and Sentinel, MODIS, ...)



Big Data Analysis

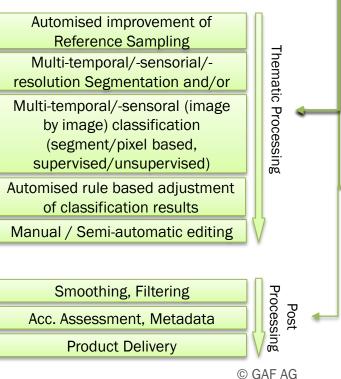


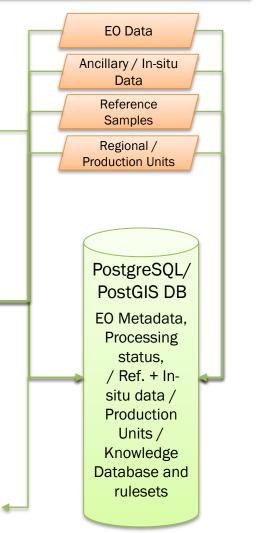




Pre-Processing

Top-of-Atmosphere Correction Geometric Validation / Correction Topographic Normalisation Indices/PCA/Tasseled Cap...

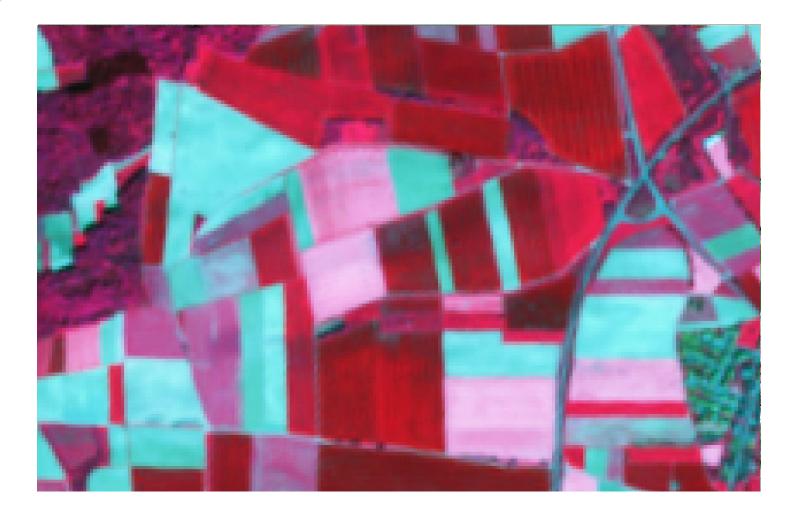




(Cloud) Infrastructure

RS Data Comparison - Agriculture





2016-05-05 Sentinel-2 10 m

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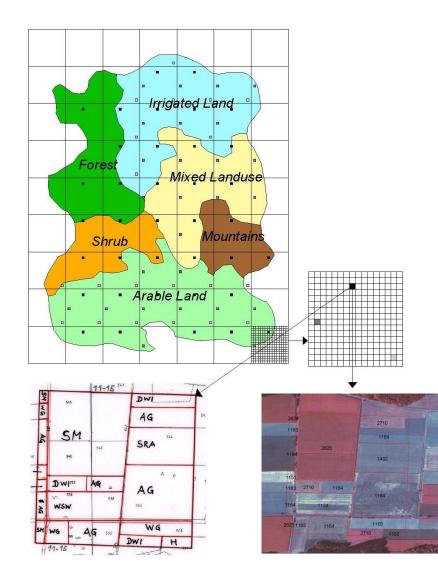
Agricultural Statistics



National Production Data – Analysis & Improvement

- Probabilistic Methods
- Qualified Informants
- Census
- Administrative Records

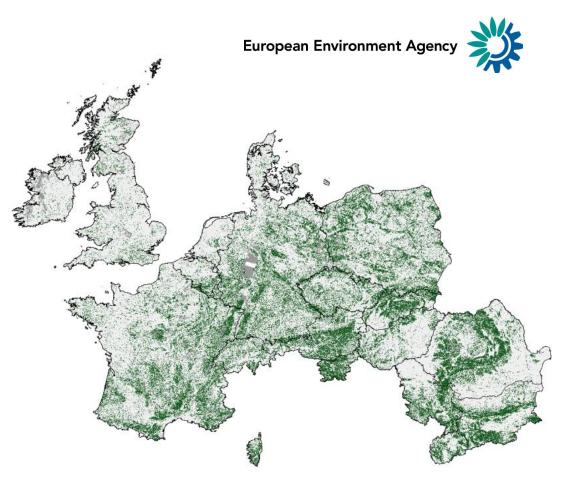




European High-Resolution Layers



- Consortium led by GAF
- 2011 2018.
- 39 countries
- High Resolution (20m)
- Forest, Grassland, Water & Wetlands, Small Woody Features, Sealed Areas

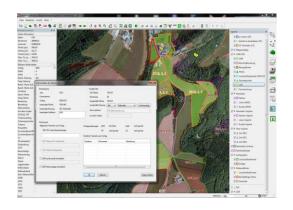


HR Layer Forest: Tree density

EU – Integrated Administrative Control System



- Administrations
 - Implementation & Update of Agricultural Reference Systems
 - GeoSpatial Cross-Checks, Risk Analysis, Controls Classical / CwRS
 - Payments

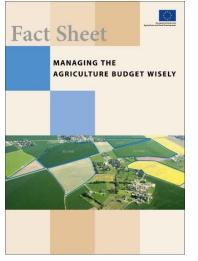




• Farmers – GeoSpatial Aid Application



EU – Control of Subsidy Declarations

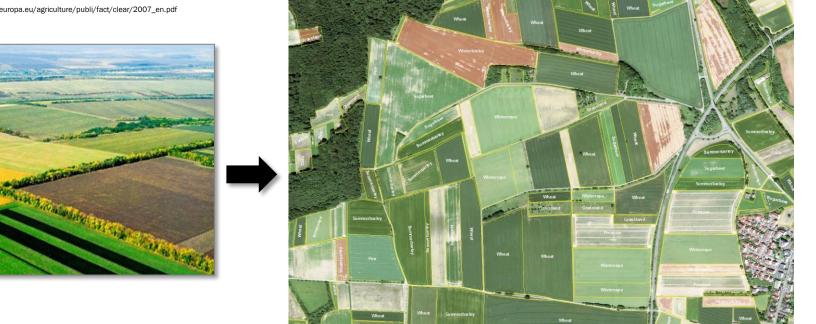


Source: http://ec.europa.eu/agriculture/publi/fact/clear/2007_en.pdf

~ 10 m Farmers

- ~ 175 m ha Agr. Land
- ~ 140 m Ref. Parcels
- ~ € 55 bn Subsidy Payments

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Digital Surface Model



- 3D Product
- Fully Operational
- VHR or HR data
- 0,3m 5m
- 125 cities (expanding)
- 5 Mio km² (expanding)

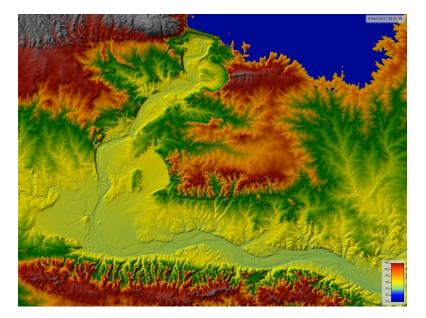


Tri-Stereo DSM Example Cape Town

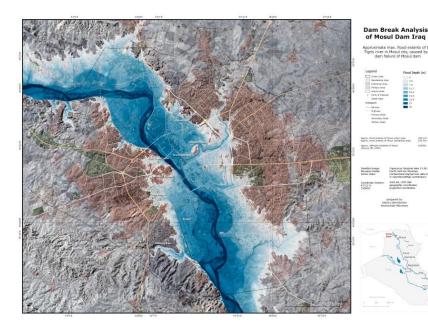
Spatial Stratification of Flood Risk



Dam Break Analysis – Mosul, Iraq (water spread & flow velocity)



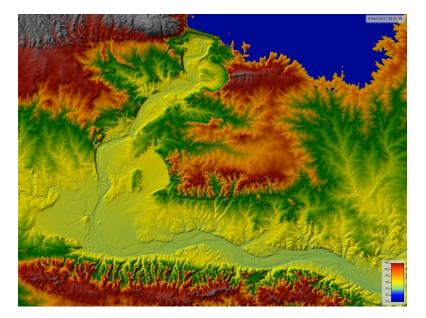
Flooding of Mosul (water spread & depth)



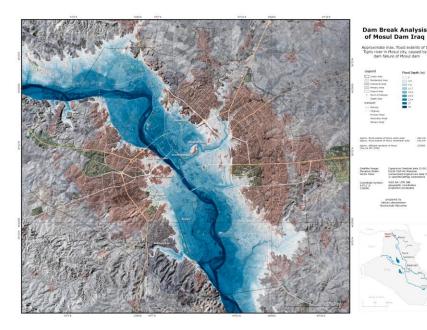
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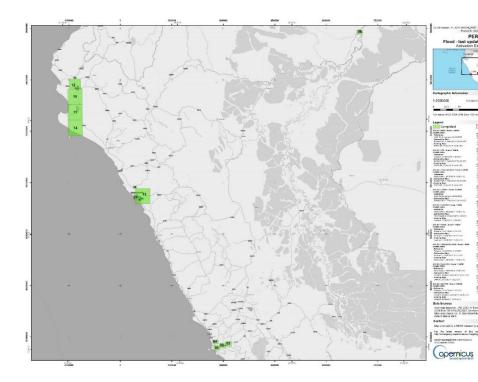


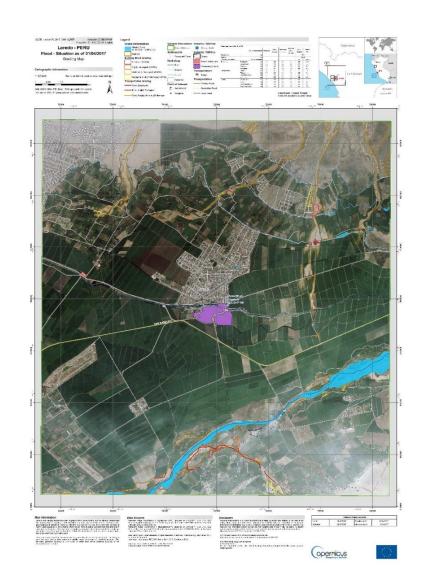
Flooding of Mosul (water spread & depth)



Emergency Management Service - EU

- Damage Assessment
 Floods, Tornados, Earthquakes, Volcanos, Industrial Accident etc.
- Operational since 2012
- Any time/every day
- Global everywhere



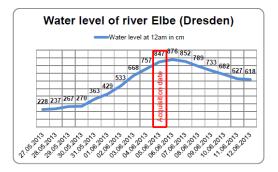


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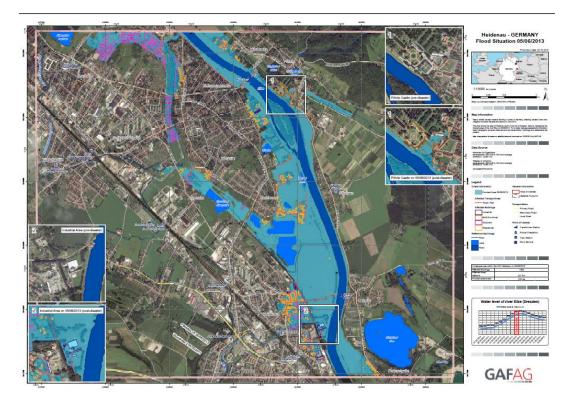
Damage Assessment on Demand



Flood (Germany, 2013)



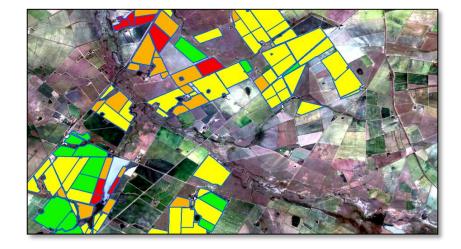
- Delineation of Flooded Area
- Flood detection / extension / progression / regression
- Information for recovery activities



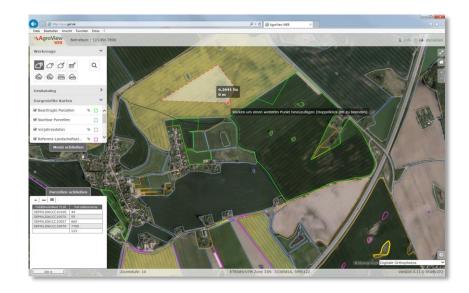
Outlook – Geo-Integrated Risk Management



Automated
 Risk Assessment



Geo-Enabled
 Loss Adjusters



Outlook – Geo-Integrated Asset Management

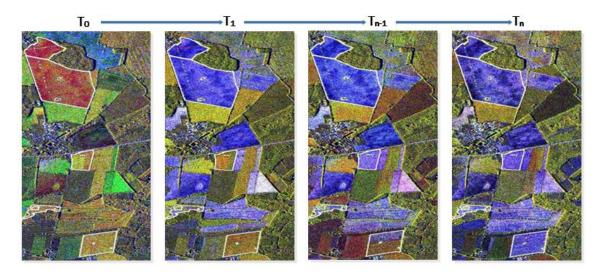
 Registration & Verification





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Automated
 Crop Monitoring





Thank you very much for your attention!

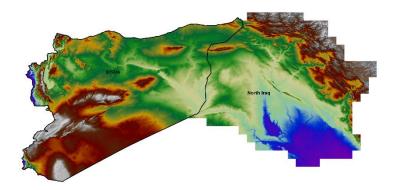
Contact: Dr. Axel Relin Email: axel.relin@gaf.de GAF AG, Arnulfstr.199, D-80634 Munich, Germany http://www.gaf.de, info@gaf.de

Damage Based Insurance



⇒ Improving established workflows:

- Risk assessment in case that claim history is not available
- Stratification of risk exposure based on geographical parameters
- Claim management



Spatial Stratification of Potential Frost Zones



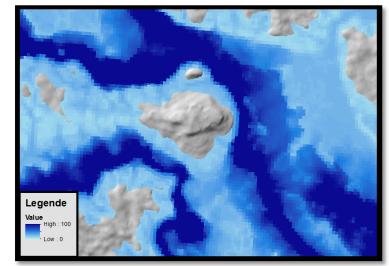
Input Data

Multisource Stereo VHR/HR Satellite Data

Further Data on Land-Use Soil etc.



Potential Frost Zonation - Regional



Potential Frost Zonation - Local

