

Für Mensch & Umwelt

Umwelt 
Bundesamt

All sensor on the environment How EO contributes to a cleaner environment

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Umweltbundesamt

Key Aspects of the green deal

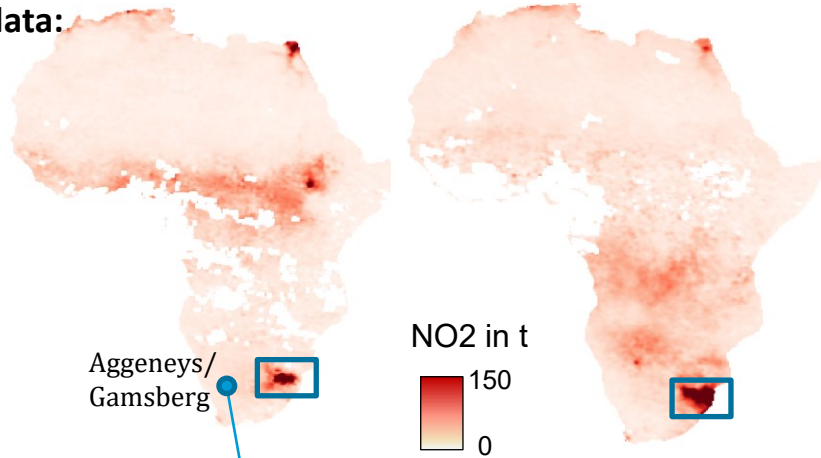
02.2012 NO2 Composite in t

08.2012 Composite NO2 Composite in t

Air Quality

Continental Scale Example data:

Georgoulas et al. 2019,
doi:10.5194/acp-19-6269-2019



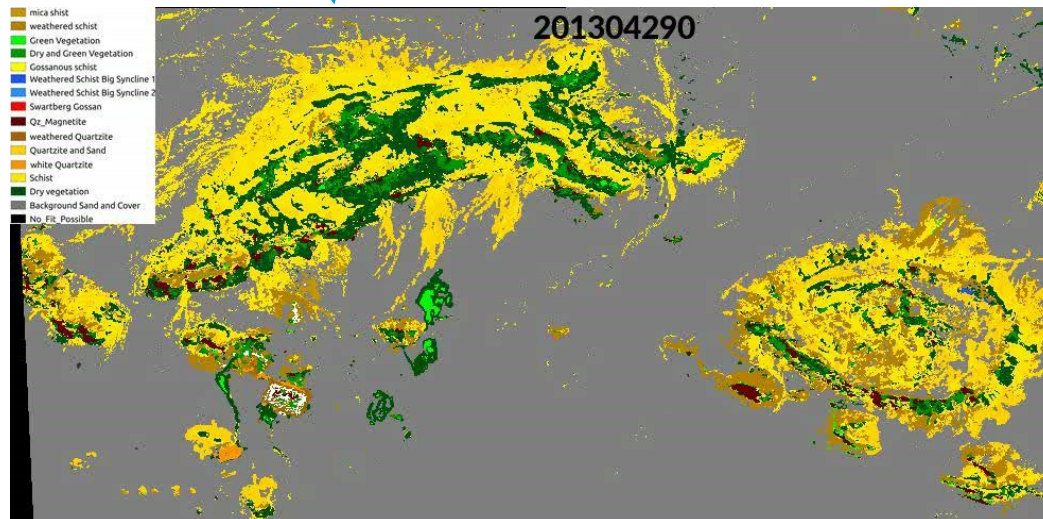
Aggeneys/
Gamsberg

□ Gauteng => the „Ruhrgebiet“ of RSA Sciamacchy & Gome

Multi-Sensor Surface Mapping

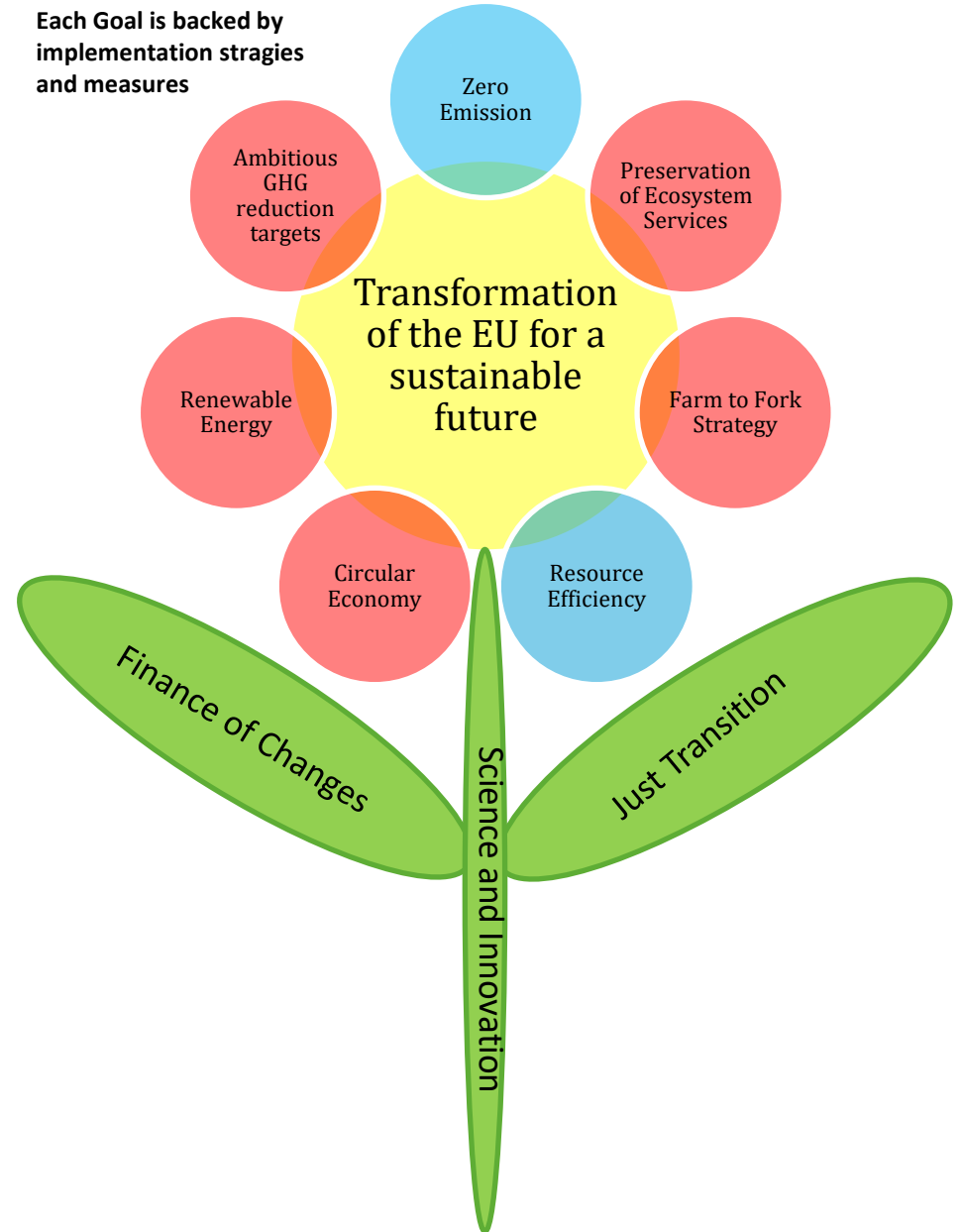
Mielke et al. 2016 & 2021

LULUCF



Contains modified Copernicus Sentinel-2 data 2013-2020

Each Goal is backed by implementation strategies and measures



EO relevant Measures of the Green Deal Action Plan

Clean Air And Climate Protection

- laws for climate protection
- strategies for climate adaption
- reassertion of the LULUCF regulation
- methane strategy
- Emission Accounting

Preservation of Biodiversity

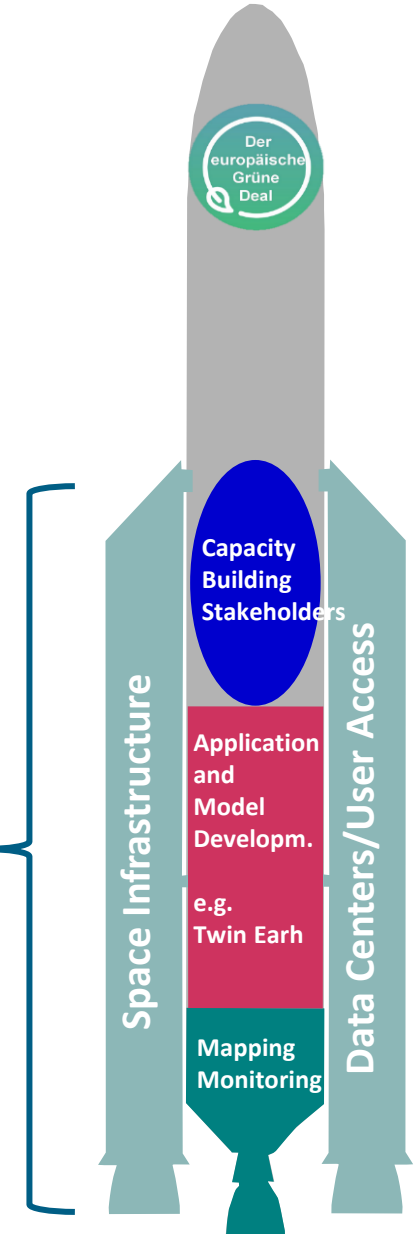
- Biodiversity Strategy 2030
- Forest Strategy
- Zero Emission Plan (air, soil, water)

Sustainable Food Supply

- Farm to Fork Strategy
- Common Agricultural Policy

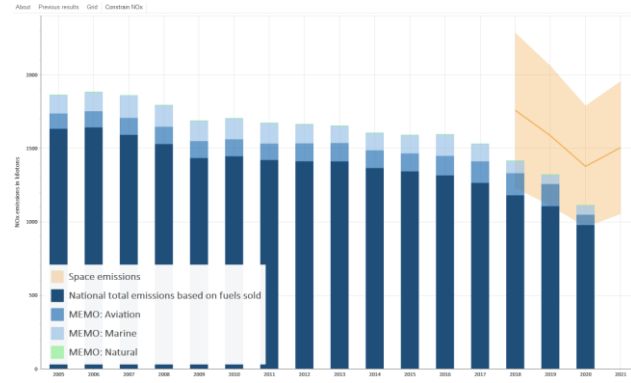
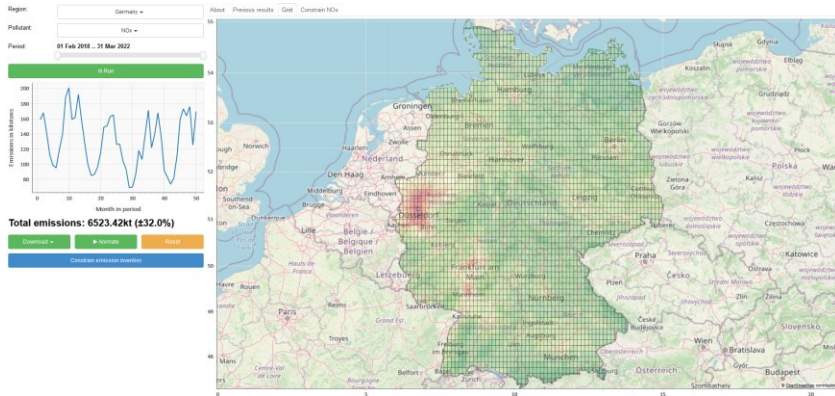
8th Environmental Action Programm

Legislators need to consider EO data and their application in laws and regulations even further than already done today.



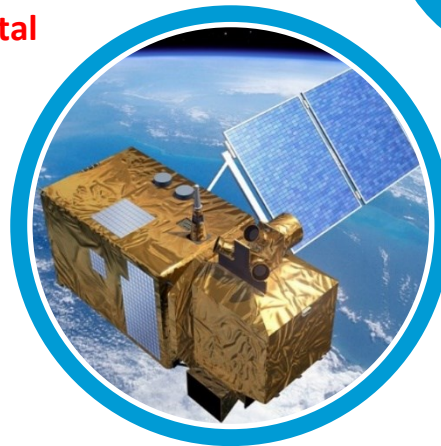
A selection of Action Items as seen by UBA

Web Application for Nox Monitoring from TROPOMI using CODE-DE Infrastructure



Environmental Reporting Goes Digital

- Link environmental reporting with social aspects (just transition)
- Orientation of environmental monitoring and reporting towards the EGD looking at cross-cutting topics
- Put Open Data on top of the agenda



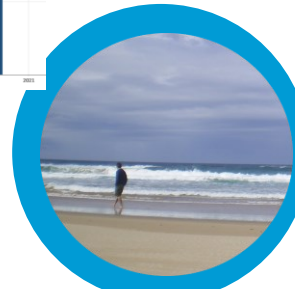
Climate, Energy and Decarbonization

- Ambitious implementation of climate laws
- Cross-sectoral investment to bolster carbon neutrality



Water and Oceans

- European „Blue Deal“ for the oceans



Sustainable Agriculture

- Refinement of the EU agricultural policy; subsidies more for climate protection than for production figures only



The Vision: continental/global monitoring, modelling and decision support system

Earth Observation



Biomass
LULUCF
Dust&Aerosols
Humidity
Wind Speed
Atmospheric-Gases

Inventory Data

National Stats.
CLRTAP/PRTR
Emission Trade
Gridded Emissions
Research Data
Agricuilt. Data



Ground Data

Ground DOAS
Isotopes
GHG+Air Poll.
Flux Towers
General Met.
Stations and
Networks



Data Analysis & Modelling

Inversion Modelling
Sector Attribution
Chemical Transport
Data Assimilation
e.g. (CCFDAS)
Flux Modelling
Aerosol Modelling
Earth System Models



Climate Scenario Modelling

Radiative Forcing
Earth System Models
Scenario Creation
Forward & Backward
Propagation
Impact Modelling & Assessment



Stakeholders

Decision Makers
General Public
Economy
NGOS
Industry

Data Input

Feedback

Data Output

Feedback & Questions

Monitoring System

Decision Support System

Ultimately a Digital Twin of the Earth

The Road Ahead, Challenges and Opportunities

GOING DIGITAL

- Digital Twin Earths („Destination Earth“) are an important step towards the solution of complex environmental and sustainability issues
- System complexity is the biggest challenge;
open data and open and transparent methods are the key to success
- **Enable stakeholders and policy relevant institutes to become application scientists instead of being mere data consumers!**

SCIENTIFIC FUNDING

- EGD is paramount to many national and international research projects,
Horizon Europe, ESA, national funding schemes
- It requires the formation of strong partnerships across disciplines in large consortias (CHE, VERIFY, COCO2); (PARIS, AVENGERS, EYE-CLIMA)

EO AND EU-LEGISLATION

- Stronger integration needed e.g. within the GHG reporting, implementation and monitoring of common agricultural policy
- **More capacity building efforts for the relevant authorities (R&D, consulting, workshops)**
- **Environmental reporting needs to be geared towards EGD actions and needs to be cross-sectoral**

Thank you for your attention!

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„Emission Situation“

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