Geospatial World Forum 2023
Space + Spatial Value Chain
ESA Earth Observation Activities

4-May-2023

Rotterdam, NL

Dr. Nicolaus Hanowski ESA/ESRIN
Earth Observation Activities at ESA

Building satellites

Managing Missions

Cal/Val & Data Distribution

Earth System Science

Applying the Data

Innovation & Commercialisation

Emergency Response

Digital Twins

Climate Change

Φ-lab

Accelerate the future of EO with cutting edge research

THE EUROPEAN SPACE AGENCY
What is the European Space Agency?

5,500+ ESA Workforce

22 Member States

Promoting cooperation among European States in space research, technology and applications, for exclusively peaceful purposes

2023 Budget

€7.08 billion = 12 per European
ESA’s Earth Observation Mission

Develop world-class Earth Observation systems with European and global partners to address scientific & societal challenges
EO supports European countries & interests

Contributions to:
- Climate Action and the European Green Deal
- Earth Science
- Weather forecasting
- Agriculture & Fisheries
- Resource Management
- Air Pollution Monitoring
- Alpine & Maritime
- Security
- ...  

+ industrial innovation, jobs and growth!
EO Supports Major International and European Policy Frameworks

**UN SDG for 2030**

- **1. No Poverty**
- **2. Zero Hunger**
- **3. Good Health and Well-being**
- **4. Quality Education**
- **5. Gender Equality**
- **6. Clean Water and Sanitation**
- **7. Affordable and Clean Energy**
- **8. Decent Work and Economic Growth**
- **9. Industry, Innovation and Infrastructure**
- **10. Reduced Inequalities**
- **11. Sustainable Cities and Communities**
- **12. Responsible Consumption and Production**
- **13. Climate Action**
- **14. Life Below Water**
- **15. Life on Land**
- **16. Peace, Justice andStrong Institutions**
- **17. Partnerships for the Goals**

**Paris Agreement on Climate Change**

**The Sendai Framework for Disaster Risk Reduction 2030**

**Reduce**
- Mortality: global population 2020-2030 Average << 2005-2015 Average
- Affected people: global population 2020-2030 Average << 2005-2015 Average
- Economic loss: global GDP 2030 Ratio >> 2015 Ratio
- Damage to critical infrastructure & disruption of basic services 2030 Values >> 2015 Values

**Increase**
- Countries with national & local DRR strategies 2020 Value >> 2015 Value
- International cooperation to developing countries 2030 Value >> 2015 Value
- Availability and access to multi-hazard early warning systems & disaster risk information and assessments 2030 Values >> 2015 Values

**Ramsar**
- Nine more years to restore the planet

**Convention on Biological Diversity**
- The Post 2020 Global Biodiversity Framework
The Big-Data Revolution with First Generation Sentinels

**Copernicus is the largest producer of EO data in the world**

- **All** global landmass is observed every 5 days at 10m resolution
- **All** data is Free, Full and Open to all*

---

**25 TB of Daily Data Production by Sentinels**

---

**300 TB of Daily Sentinel Products Disseminated for Services to Society**

---

* ESA Sentinel Data Policy (Sep 2013) and EU Delegated Act on Copernicus Data and Information Policy (Dec 2013)
Copernicus: Sentinel Expansion Missions

- **CO2M** - Anthropogenic CO₂ Monitoring
  - Causes of Climate Change

- **LST** - Land Surface Temperature Mission
  - Agriculture & Urban Management

- **CRISTAL** - Polar Ice & Snow Topography
  - Effects of Climate Change

- **CHIME** - Hyperspectral Imaging Mission
  - Food Security, Soil, Minerals, Biodiversity

- **CIMR** - Passive Microwave Radiometer
  - Sea: Surface Temp. & Ice Concentration

- **ROSE-L** - L-band SAR Mission
  - Vegetation & Ground Motion & Moisture
Digital Twin Earth (DTE)

SHAPING EUROPE'S GREEN AND DIGITAL FUTURE

Destination Earth (DestinE) will support the European Union's Green Deal and Digital Strategy and will enable policymakers and users to reach the next step in informed decision-making.