



Technological and Scientific Drivers

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The European landscape

EUMETSAT Destination 2030, be the leading user-driven operational agency in Europe, and a trusted global partner, for weather and Earth system monitoring from space.

ESA-ECMWF Key partners. ESA and ECMWF play a relevant role in the European EO and Copernicus context.

The EU Green Deat: a roadmap for making the EU's economy sustainable by turning climate and environmental challenges into opportunities.

Copernicus, is the European Union's Earth observation programme, looking at our planet and its environment to benefit all European citizens.

The Digital Europe Programme, (DIGITAL) is a new EU funding programme focused on bringing digital technology to businesses, citizens and public administrations.



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Earth System Value Cycle

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Classification

Evolution of the seamless Earth System Prediction

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GLOBAL NWP - DATA ASSIMILATION FROM MINUTES TO MONTHS

Requirements for future satellite missions depend more and more on the evolution of the seamless earth system prediction. Ex. coupled data assimilation, ML and DA, DA time window dependency, Climate Reanalysis. Could we guess what such system will be in 10–15 years time?

NOWCASTING AND SHORT RANGE FORECAST – CLOSING THE GAP

Overlaying Rapid Update Cycle model data with the radar data opens the door to new applications and additional needs for high-frequency satellite data

REFERENCES

2021 ECMWF Annual Seminar on Observations was held jointly with the WCRP-WWRP Symposium on Data Assimilation and Reanalysis. EUMETSAT Meteorology Satellite Conference 2021



By courtesy of T McNally ECWMF





Earth System Prediction

Evolution in engineering and technology



FRONTIER ENGINEERING AND TECHNOLOGY

New Constellations with an increased capacity to deliver high resolution and high freq data. Cloud based solutions (Ex. Wekeo, DestinE) - ML and Al applications New EO technologies - value chain

SPACE TO GROUND and GROUND SEGMENT

Optical feeder links to the ground from highthroughput spacecraft, systems based on 1.55µm

wavelength technology are expected to enable to transmit up to several terabits over one active link. . Al and ML applications to processors and data transmission.

Engineering and technology

Evolution of EO market – a fast changing landscape

By courtesy of Copernicus

CLIMATE SERVICES

End users represent much larger markets than the Earth Observation (EO) downstream market, and therefore even moderate contributions of Copernicus in terms of data inputs can potentially generate large benefits (i.e., Agriculture). Emerging value chains remain rather challenging, such as insurance, renewable energy, urban planning..

NEW EMERGING SECTORS FOR SEAMLESS EARTH SYSTEM PREDICTION

The energy & utilities the largest share in the weather forecasting services market. Autonomous vehicle (i.e., cars, drones) characterizes vehicle performance under adverse weather conditions at different levels of automation.

REFERENCES

Copernicus Market Report 2019 Weather Forecasting Services Market by Industry, Global Forecast to 2025 Vehicle Automation and Weather: Challenges and Opportunities. U.S. Department of Transportation Report 2016



E0 market evolution

EUM/GES/TEM/07/2025, v2W, 5 March 2019

Classification

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Thank you!

Questions are welcome

EUM/GES/TEM/07/2025, v2W, 5 March 2019