MAFIS-Multiple Actors Forest Information System: EO+AI+ODC for scalable forest monitoring services

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The Mission of GMATICS is to offer systematic monitoring services based on Earth Observation data, Artificial Intelligence techniques and Open Data Cube architectures.

After the development of two initial services, GMATICS is now focusing on forest monitoring through the ESA funded project MAFIS-Multiple Actors Forest Information System.

What is MAFIS? MAFIS performs a systematic monitoring of forests in natural environments as well as of forests and green areas in urban environments.

What is MAFIS composed of? For the natural environment we use time-series of multi-mission satellite data (Multispectral, SAR, Hyperspectral, and VHR) and in-situ surveys while for forests and green areas in urban environments we also use other geo-spatial data from aerial orthophotos, LIDAR sensing, drone surveys and specialized in situ measurements. All kind of data are organized within an Open Data Cube architecture and are processed and integrated by using various AI techniques. We also use a forest growth model, exploiting extensive meteorological data, and we make MAFIS service accessible through a Web-GIS platform, enabling customer access from desktop and mobile devices.

What are the MAFIS outputs? A set of information layers suitable for different potential users: main tree species classification, identification of forest clear-cuts and selective cuttings, detection of disturbances due to forest fires, diseases or windstorms, estimation of Above Ground Biomass (AGB) gain and losses, detailed urban and peri-urban green area assessment for planning purpose, estimation and spatial assessment of various ecosystems services (carbon sequestration,
pollutant removal, thermal comfort, pollen risks, etc.), monitoring of tree status for maintenance actions identification and prioritization.

Who are MAFIS potential users? Ministries of agriculture and environment, Local Administrations, wood-chain industry, municipalities, architects and urban planners, tree care and nursery companies, multiutility companies, International Organizations, Universities and Research Centres (forests, ecology, architecture).