

IAF EARTH OBSERVATION SYMPOSIUM (B1)

50 years of Earth observation: The contribution to sustainable development goals and plans for the future
(6)

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APPLICATIONS OF SATELLITE EARTH OBSERVATIONS TO FOREST MANAGEMENT IN BENIN
AND GHANA IN SUPPORT OF SUSTAINABLE DEVELOPMENT GOAL 15

Abstract

In Ghana, the government is working to manage illegal gold mining and remediate the degradation it causes in forests, soil and terrestrial waterways. In Benin, the national remote sensing agency is improving management of terrestrial and coastal forests, especially mangroves; they are also improving techniques for land use mapping and fire monitoring. This presentation describes a project funded by the Ecological Forecasting program element of the NASA Applied Sciences Program within the Earth Sciences Division as part of a solicitation that specifically targets projects supporting Goal 14 (Life below Water) and Goal 15 (Life on Land) of the 2030 Agenda for Sustainable Development. The project brings together scientists and application developers from academia, government and industry in three countries to design systems based on priorities expressed by project contributors in Ghana and Benin.

Ghana and Benin are part of a similar ecosystem – low-lying regions with inter-connected brackish coastal lagoon ecosystems and freshwater lakes. Inland areas in Ghana were once covered by dense tropical forest that has now been mostly fragmented, while Benin was primarily a dense woodland. Most of primary forested areas are now only found in protected areas.

This project pursues the following objectives and methodologies aligned with Goal 15 of the 2030 Agenda for Sustainable development. In support of Indicator 15.1.1 (Forest area as a proportion of total land area), the project generates 20-30 meter resolution country wide maps of vegetated areas including forest, mangroves, grasslands, savannahs, coastal and freshwater wetlands and floating vegetation using Landsat, Sentinel 1 and 2 and high-resolution data from commercial sources. In response to Indicator 15.2.1 (Progress towards sustainable forest management), the project maps illegal gold mine impact, especially in Western Ghana using Landsat and Sentinel 1 and 2 datasets. The paper gives examples of improving governance of ecosystems by building capability for institutions in Benin and Ghana to apply satellite-based earth observation along with other geospatial data in support of national activities for the SDGs. The paper applies a Systems Architecture Framework to define the context, stakeholders, objectives and project functions that are adopted to improve project outcomes. The stakeholders identified key objectives as reducing the time required to perform geospatial analysis at the national scale, improving the ability to respond to forest degradation or fires quickly and overcoming infrastructure barriers that make it costly to manage large data sets.