

# **EARTH OBSERVATIONS AND GEOSPATIAL INFORMATION: SUPPORTING OFFICIAL STATISTICS IN MONITORING AND ACHIEVING THE 2030 AGENDA**



The 2030 Agenda for Sustainable Development was adopted in 2015 by world leaders who recognized the critical importance of “transparent and accountable scaling-up of appropriate public-private cooperation to exploit the contribution to be made by a wide range of data, including earth observation and geospatial information, while ensuring national ownership in supporting and tracking progress<sup>1</sup>”.

The Global Indicator Framework captures the interlinked, multifaceted and ambitious aspirations for the continued development of nations and societies. Effective reporting of progress toward these Indicators requires the use of multiple types of data, what we have in hand - traditional national accounts, household surveys and routine administrative data – as well as new sources of data, namely Earth observations, geospatial information, citizen science, and Big Data.

Integrating all of these data represents a quantum leap in how we monitor and track development and advance the well-being of our societies. Since Earth observations and geospatial information are often continuous in their spatial and temporal resolutions, they help capture the sustainability of development. Further, Earth observations and geospatial information, which include satellite, airborne, land- and marine-based data, as well as model outputs, can significantly expand monitoring capabilities at local, national, regional and global levels, and across sectors.

Exploiting various data sources, including Earth observations and geospatial information, reduces the cost of monitoring the Sustainable Development Goals (SDGs) and their associated Targets and Indicators, and makes SDG reporting manageable and sustainable within the limited resources available to national governments. In addition, use of Earth observations and geospatial information to measure and monitor progress toward achieving the SDGs will provide developing countries and regions with increased capacity to acquire, analyze, and utilize these data for other policy-making purposes.

<sup>1</sup> [http://www.un.org/ga/search/view\\_doc.asp?symbol=A/RES/70/1&Lang=E](http://www.un.org/ga/search/view_doc.asp?symbol=A/RES/70/1&Lang=E)



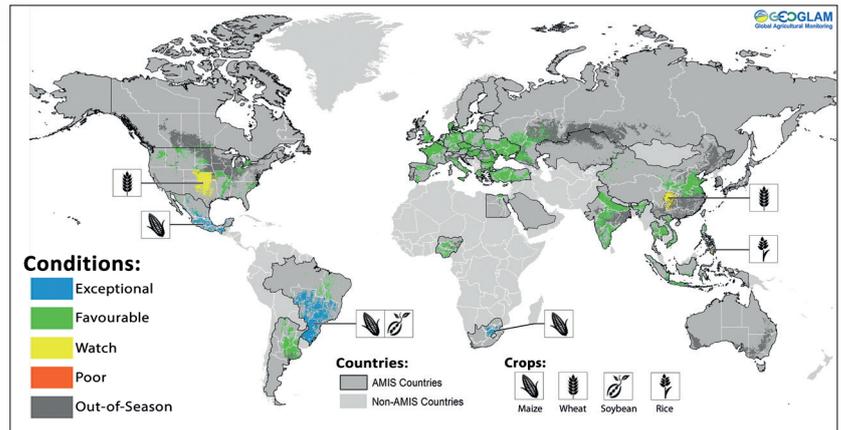
# SUSTAINABLE DEVELOPMENT STATISTICS INFORMED BY



**Target 2.c** Adopt measures to ensure the proper functioning of food commodity markets and their derivatives and facilitate timely access to market information, including on food reserves, in order to help limit extreme food price volatility.

## MONITORING CROP CONDITIONS

*GEOGLAM Crop Monitor for AMIS, synthesis of crop conditions as of March 28, 2017. Areas which are in other-than-favorable conditions are shown with the affected crop. Four major global crops, wheat, maize, rice and soybeans are monitored in 51 countries (G20 Members plus Spain and seven countries), representing 80-90 percent of the global production of the four commodities. Find more on Twitter @G20 GEOGLAM or at [www.geoglam.org](http://www.geoglam.org)*



GEO Global Agricultural Monitoring forms part of the G20 Action Plan on Food Price Volatility, through the Crop Monitor for AMIS providing timely and accurate consensus reporting on crop conditions based on reports by national, regional and international partners. A second crop monitor, the Crop Monitor for Early Warning, gives crop conditions in 83 countries at risk of food insecurity, contributing to Goal 1, No Poverty, Goal 2, Zero Hunger and Goal 3, Good Health and Wellbeing.

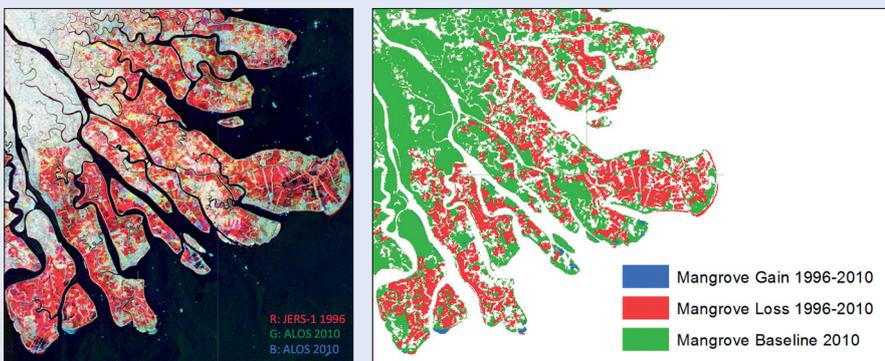


**Target 6.6** By 2020, protect and restore water-related ecosystems, including mountains, forests, wetlands, rivers, aquifers and lakes.

**Indicator 6.6.1** Change in the extent of water-related ecosystems over time.

## GLOBAL MANGROVE WATCH – MAPPING EXTENT AND ANNUAL CHANGES IN THE GLOBAL MANGROVE COVER

JAXA/METI / Global Mangrove Watch, 2015



*Left: Mahakam delta, East Kalimantan. L-band SAR temporal composite. Red areas indicate mangrove loss.*

*Right: Corresponding mangrove change map, showing 2010 extent in green and changes between 1996 and 2010 in red (losses) and blue (gains).*

Mangroves are of critical importance as breeding and nursery areas for birds, fish and shellfish and play an important role in the regulation of freshwater, nutrients and sediment inputs into the marine coastal waters. They provide coastal protection from storms and as more organic carbon is produced than degraded they constitute significant pools for carbon sequestration, categorized as forests within the UNFCCC REDD+ scheme. The Ramsar Convention on Wetlands, together with UN Environment, is supporting the development and implementation of this SDG Indicator.

# EARTH OBSERVATIONS AND GEOSPATIAL INFORMATION



**Target 11.6** By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management.

**Indicator 11.6.2** Annual mean levels of fine particulate matter (eg. PM2.5 and PM10) in cities (population weighted).

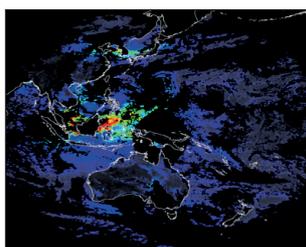
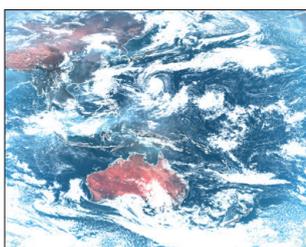


**Target 3.9** By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination.

**Indicator 3.9.1** Mortality rate attributed to household and ambient air pollution.

## MEASURING AIR QUALITY IN CITIES AND ACROSS REGIONS

JAXA EORC



*Himawari-8 geostationary satellite delivers aerosol data every 10 minutes with 5km resolution. Hot spot detection and forest fire monitoring are conducted using other low Earth orbiting satellites, together contributing to estimates of particulate matter.*

Air pollution is now considered the world's largest environmental health risk. The World Health Organization (WHO) attributes 3.2 million deaths to air pollution in 2012. People living in Asia are considered most at risk. Fine particulate matter concentrations over cities are estimated by numerical modeling, integrating satellite data and in situ data. Data are critical for policy decision making on air quality management in urban areas. Monitoring air quality through Earth observations can increase cooperation between Europe, Asia-Pacific countries, and the US, and foster cooperation in monitoring haze caused by forest fires, yellow sands, and air pollution.

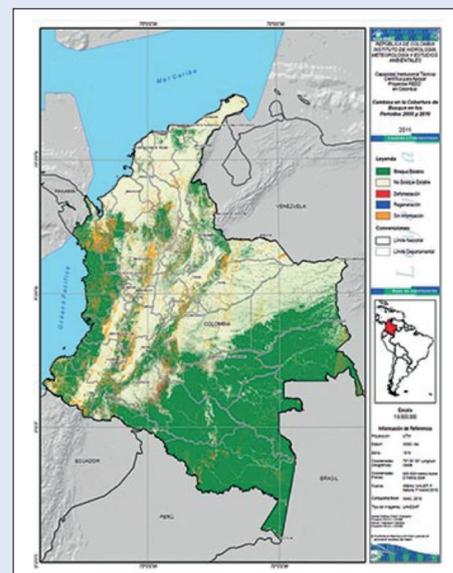


**Target 15.2** By 2020, promote the implementation of sustainable management of all types of forests, halt deforestation, restore degraded forests, and substantially increase afforestation and reforestation globally.

**Indicator 15.2.1** Progress towards sustainable forest management.

## EARTH-OBSERVING SATELLITES CAN TRACK TREE COVER EXTENT AND FOREST LOSS AND GAIN OVER TIME

The Intergovernmental Panel on Climate Change (IPCC) has reported that land-use change, dominated by tropical deforestation, make up to one quarter of human-induced CO2 emissions. Reducing Emissions from Deforestation and forest Degradation (REDD+) and the role of conservation, sustainable management of forests, and enhancement of forest carbon stocks in developing countries looks to provide financial incentive for countries to maintain and sustain forests. GEO's Global Forest Observations Initiative (GFOI) aims to provide countries with satellite data coverage in addition to methods and guidance to facilitate reporting. Further, GEO's Initiative, Earth Observations in Service of the 2030 Agenda for Sustainable Development (EO4SDGs), is currently working with, and looking for additional candidate, countries to demonstrate the added value of Earth observations and geospatial information to help track, measure, and monitor progress towards sustainable forest management, and support national-level SDG reporting.



# EARTH OBSERVATION AND GEOSPATIAL INFORMATION LINKAGES TO SDG GOALS, TARGETS AND INDICATORS



Target Contribute to progress on the Target, not necessarily the Indicator									Goal	Indicator Direct measure or indirect support to the Indicator					
							1.4	1.5	1 No poverty	1.4.2					
						2.3	2.4	2.c	2 Zero hunger	2.4.1					
					3.3	3.4	3.9	3.d	3 Good health and well-being	3.9.1					
									4 Quality education						
								5.a	5 Gender equality	5.a.1					
	6.1	6.3	6.4	6.5	6.6	6.a	6.b		6 Clean water and sanitation	6.3.1	6.3.2	6.4.2	6.5.1	6.6.1	
					7.2	7.3	7.a	7.b	7 Affordable and clean energy	7.1.1					
								8.4	8 Decent work and economic growth						
					9.1	9.4	9.5	9.a	9 Industry, innovation and infrastructure	9.1.1	9.4.1				
						10.6	10.7	10.a	10 Reduced inequalities						
	11.1	11.3	11.4	11.5	11.6	11.7	11.b	11.c	11 Sustainable cities and communities	11.1.1	11.2.1	11.3.1	11.6.2	11.7.1	
				12.2	12.4	12.8	12.a	12.b	12 Responsible consumption and production	12.a.1					
					13.1	13.2	13.3	13.b	13 Climate action	13.1.1					
		14.1	14.2	14.3	14.4	14.6	14.7	14.a	14 Life below water	14.3.1	14.4.1	14.5.1			
	15.1	15.2	15.3	15.4	15.5	15.7	15.8	15.9	15 Life on land	15.1.1	15.2.1	15.3.1	15.4.1	15.4.2	
								16.8	16 Peace, justice and strong institutions						
17.2	17.3	17.6	17.7	17.8	17.9	17.16	17.17	17.18	17 Partnerships for the goals	17.6.1	17.18.1				

For more information please contact:

Argyro Kavvada, NASA/BAH and EO4SDGs Initiative, E-mail: Argyro.Kavvada@nasa.gov

William Sonntag, GEO Secretariat, wsonntag@geosec.org

[www.earthobservations.org](http://www.earthobservations.org) | Twitter: @geosec2025 #openEOdata | FB: Group on Earth Observations