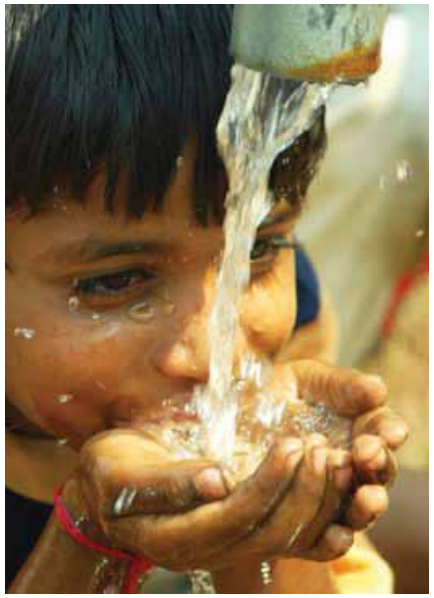
7th Meeting of the Interagency and Expert Group on Sustainable Development Goal Indicators

Vienna, Austria | 12 April, 2018



Integrating and Visualizing Earth Observation Data for the SDGs

Mike Gill

GEO BON Co-Chair

NatureServe Director of Biodiversity Indicators Program

Argyro Kavvada

NASA Earth Science/BAH & GEO EO4SDG

GEO GROUP ON EARTH OBSERVATIONS

EARTH OBSERVATIONS FOR THE SUSTAINABLE DEVELOPMENT GOALS

NatureServe

Societal Benefit Areas & SDGs

Public Health Surveillance

Water Resources

Biodiversity & Ecosystem Sustainability

Energy

Disaster Resilience

Food Security / Agriculture

Transportation / Infrastructure

Urban Development

GEO GROUP ON EARTH OBSERVATIONS

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				

EARTH OBSERVATIONS FOR THE SUSTAINABLE DEVELOPMENT GOALS

GEO GROUP ON EARTH OBSERVATIONS

Earth Observations in Service of the 2030 Agenda

Purpose:

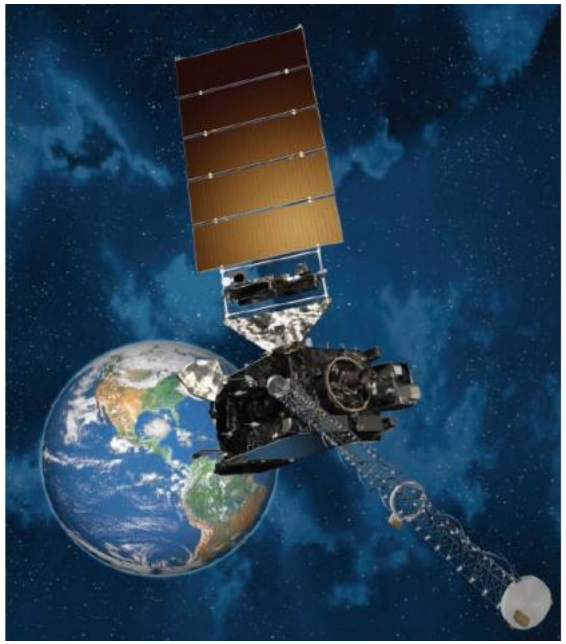
Organize and extend the potential of Earth observations and geospatial information within GEO to advance the *2030 Agenda* and enable societal benefits through achievement of the SDGs.

Key Emphasis:

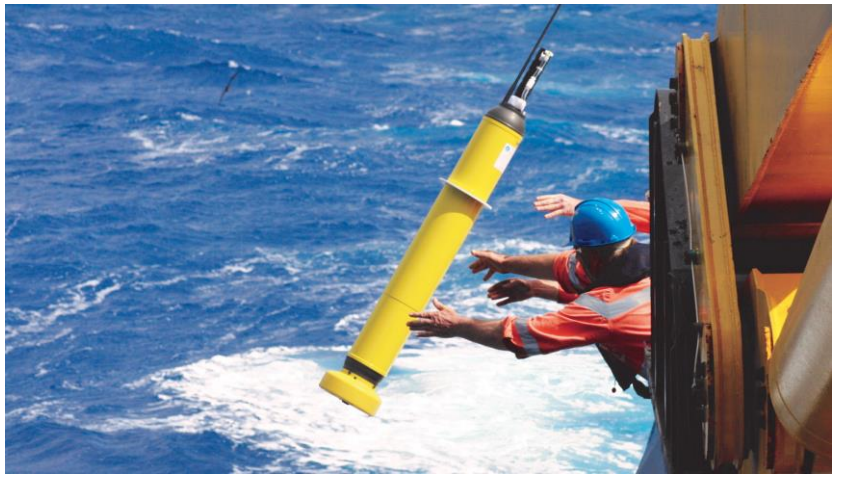
Collaborations with global statistical community, NSOs, line ministries, custodian agencies. Also, communication role in a federated approach to GEO community.

Ground-based instruments used to observe precipitation include rain gauge tipping buckets, cylinders, and disdrometers & radar systems [top]

A sensor pod from NASA – Jet Propulsion Laboratory



The GOES-R Series—a collaborative program between NASA and NOAA.



Argo floats are used to observe the ocean [image from Commonwealth Scientific and Industrial Research Organization]

Researchers with the University of Alaska-Fairbanks (UAF) use small aircraft such as the Havilland DHC-3 Otter. Credit: UAF

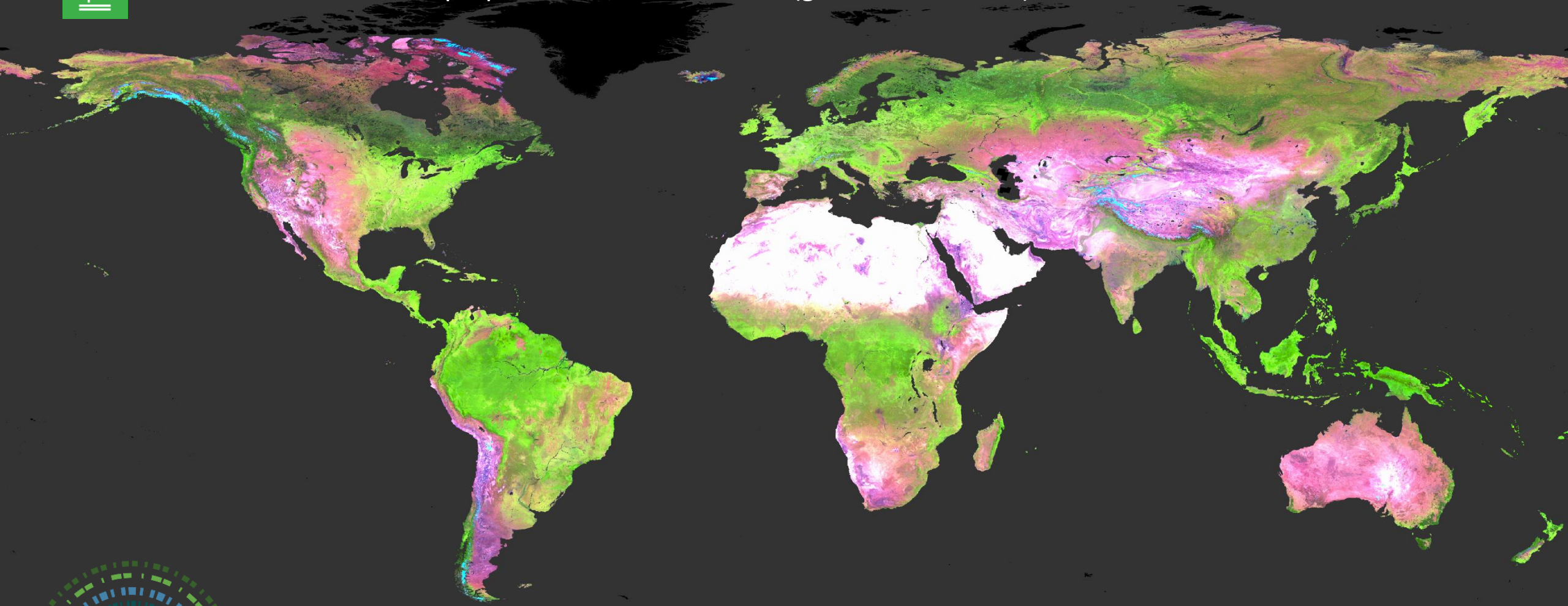
Space-based
Satellites

Airborne

Ground-based

In Situ

15.1.1 Forest Area as a proportion of total land area (global forest cover)

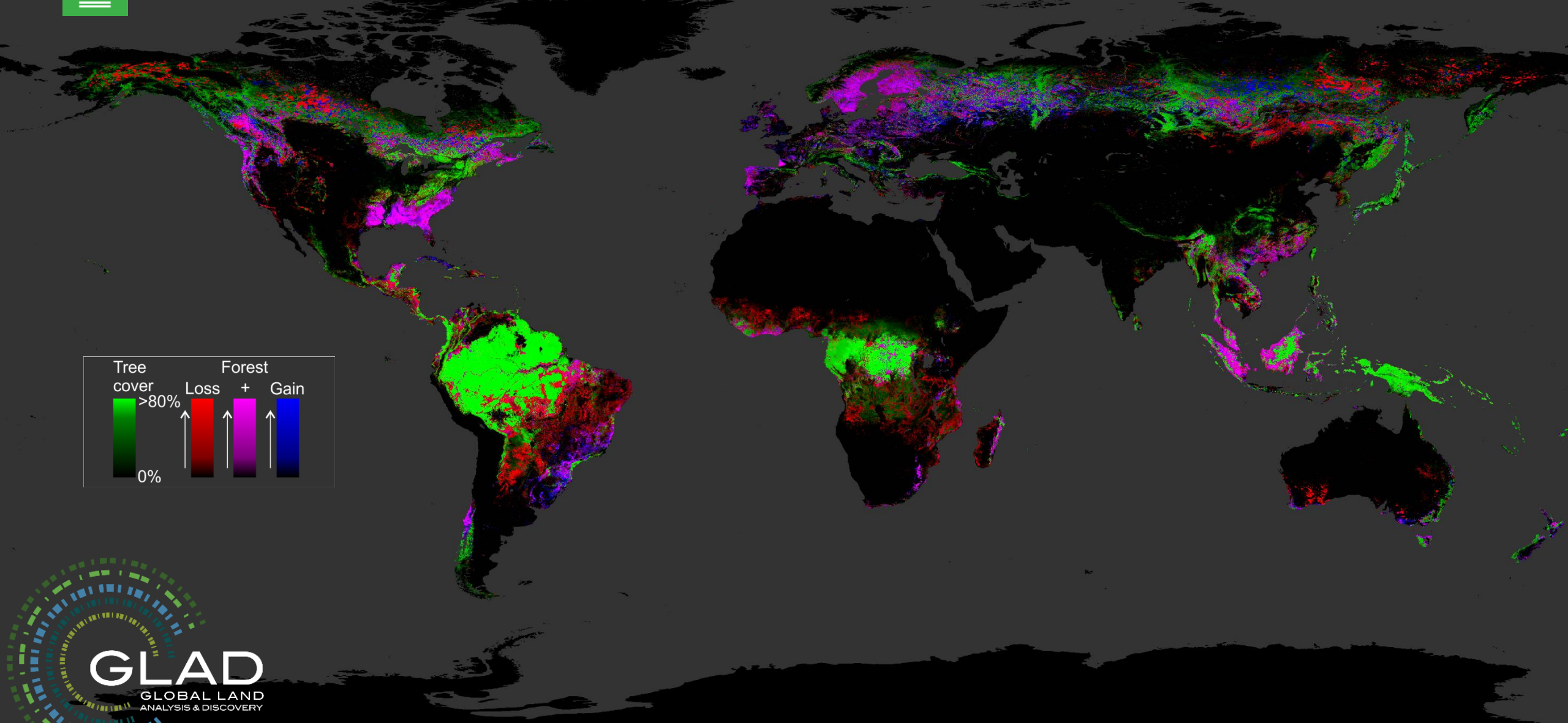


GLAD
GLOBAL LAND
ANALYSIS & DISCOVERY

Landsat 5-4-3
2000 best pixel composite

UNIVERSITY OF
MARYLAND

15.1.1 Forest Area as a proportion of total land area (global forest cover)

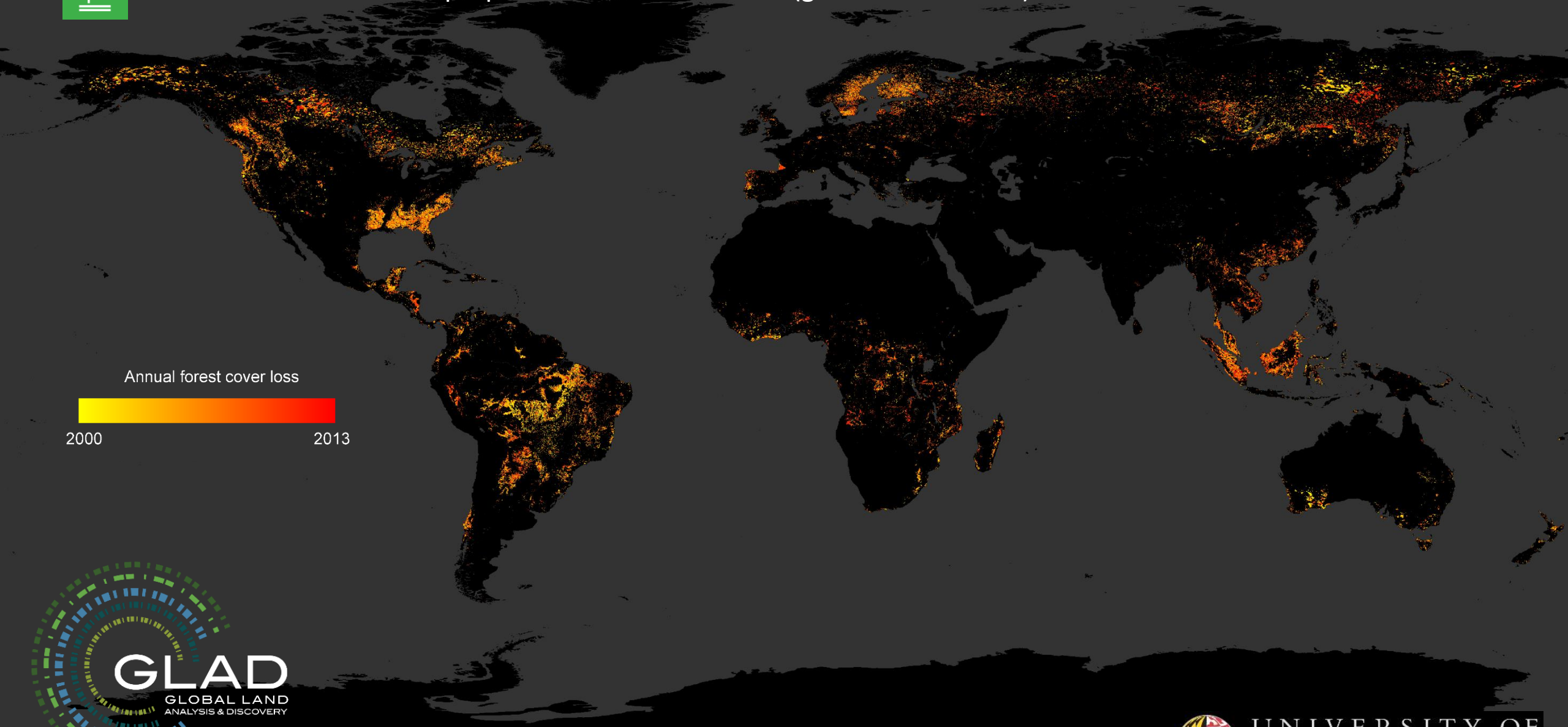


GLAD
GLOBAL LAND ANALYSIS & DISCOVERY

2000 to 2013 tree cover extent and forest loss and gain

UNIVERSITY OF MARYLAND

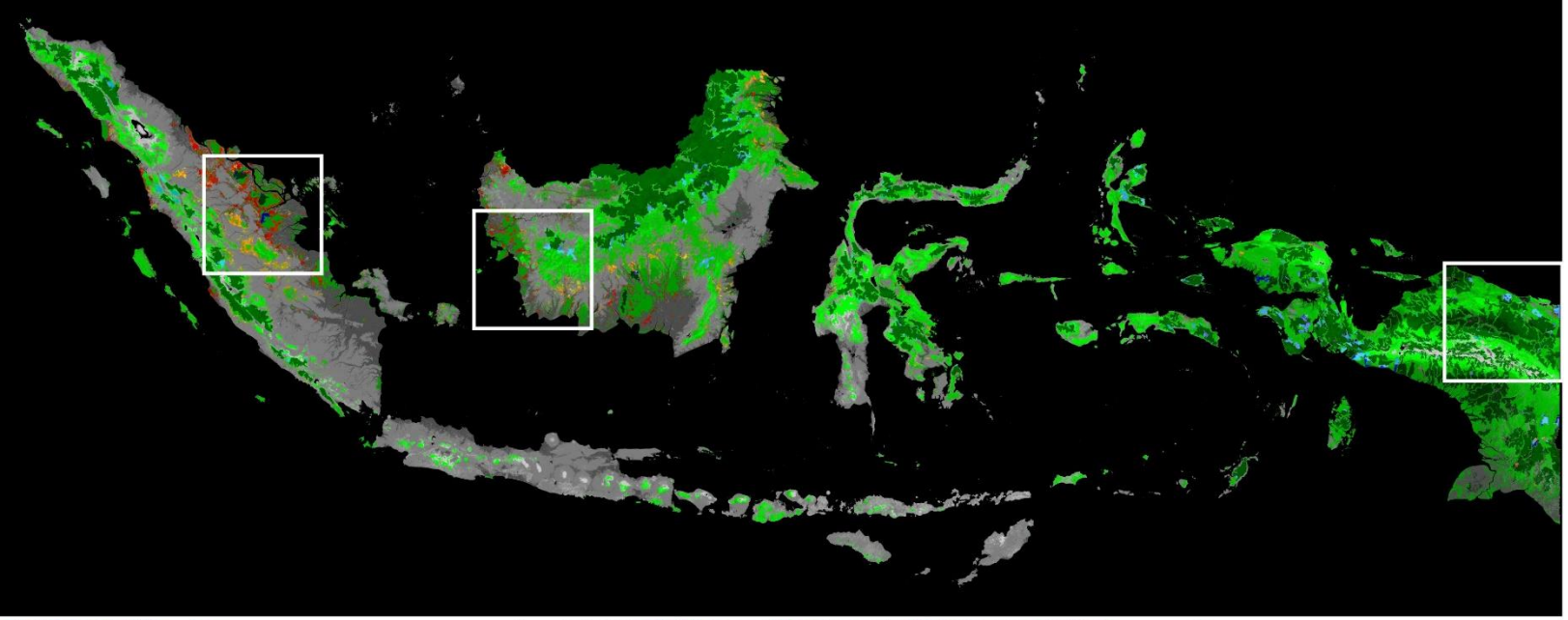
15.1.1 Forest Area as a proportion of total land area (global forest cover)

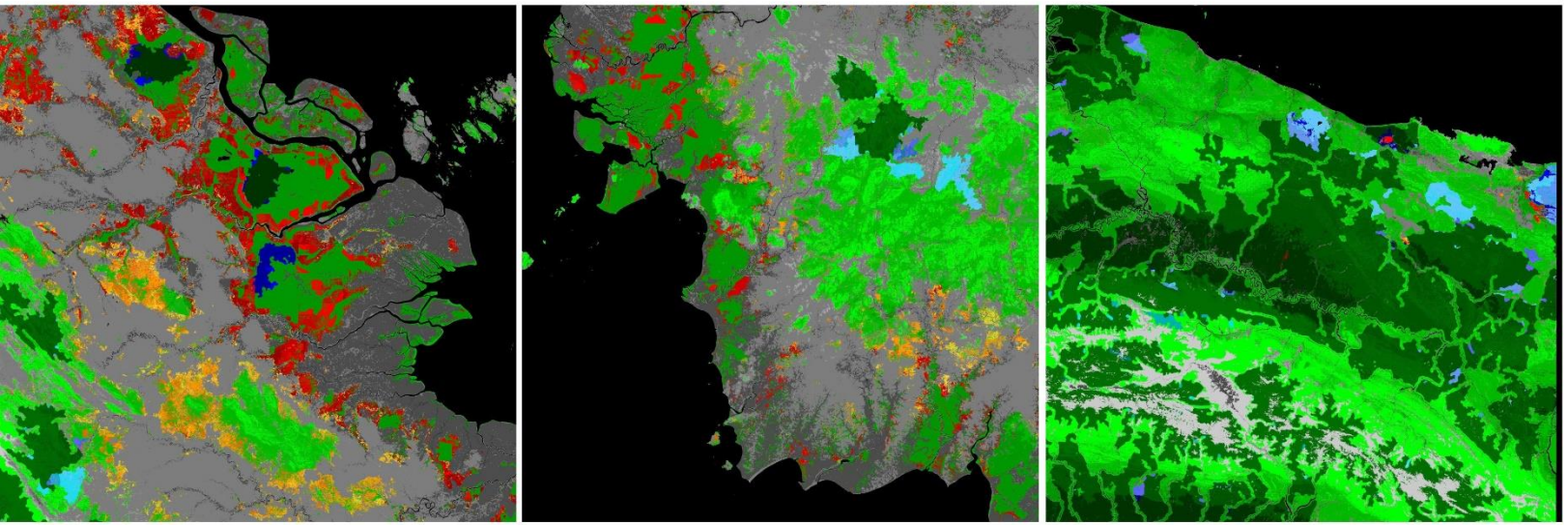


GLAD
GLOBAL LAND
ANALYSIS & DISCOVERY

2000 to 2013 annual loss

UNIVERSITY OF MARYLAND

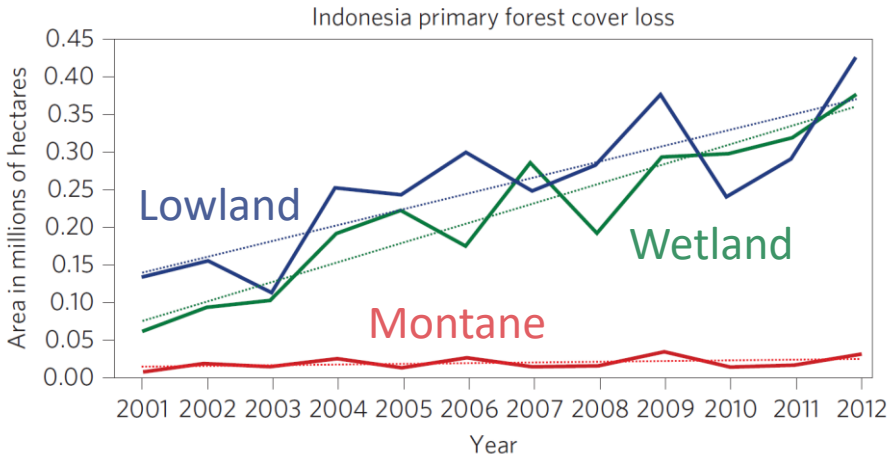




15.7Mha of mapped gross forest cover loss
14.4 ± 2.0Mha of reference gross forest cover loss

6.2Mha mapped primary forest loss
7.5 ± 2.2Mha of reference primary forest loss

10.7Mha of forest loss from MoF



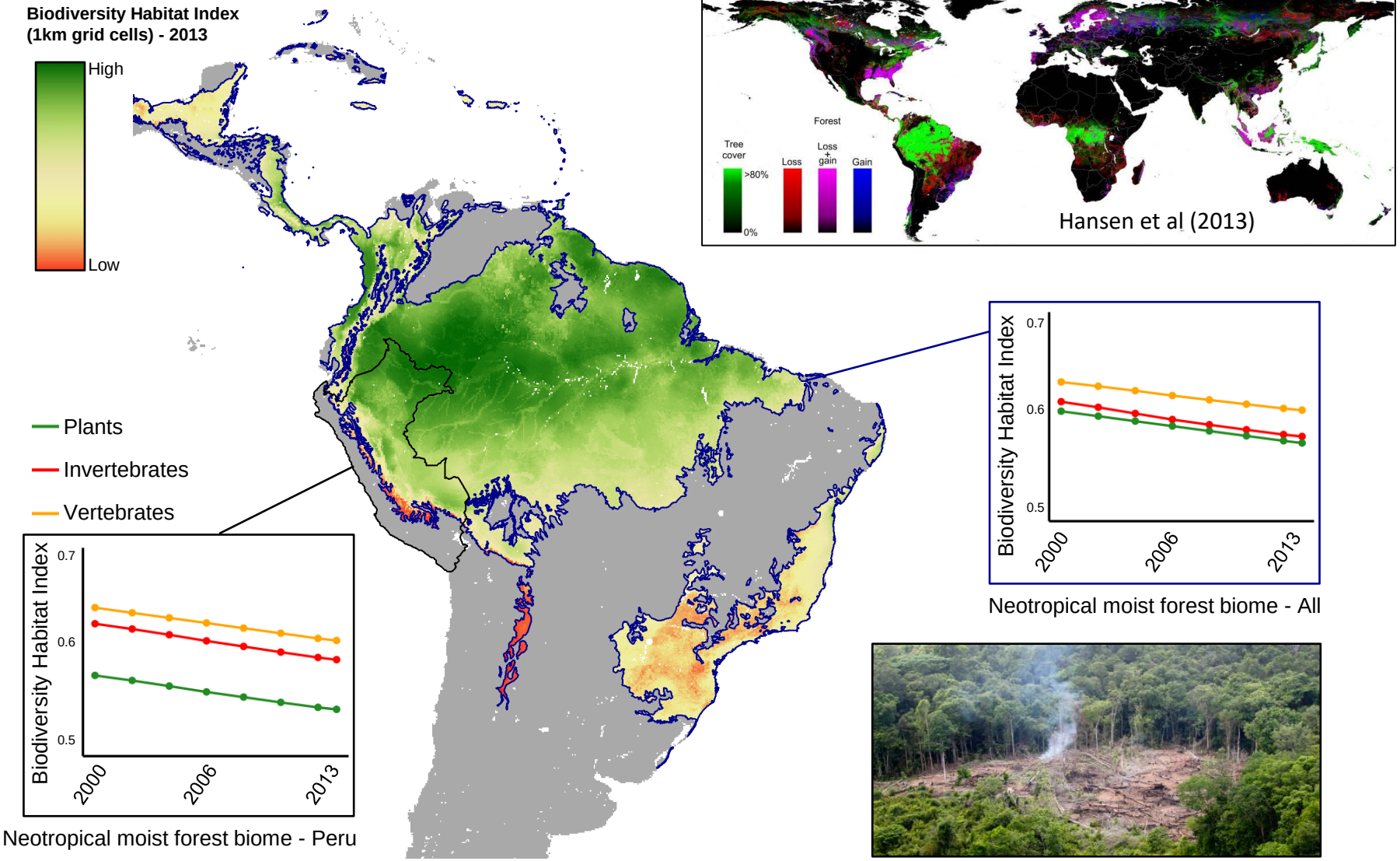
Annual primary forest loss disaggregated by landform for Indonesia as a whole, and the island groups of Sumatra, Kalimantan and Papua. Dashed lines are linear fits to the data

- wetland
- lowland
- montane
- intact wetland forest
- intact lowland forest
- intact montane forest
- degraded wetland forest
- degraded lowland forest
- degraded montane forest
- wetland forest loss 00-05
- wetland forest loss 05-10
- wetland forest loss 10-12
- lowland forest loss 00-05
- lowland forest loss 05-10
- lowland forest loss 10-12
- montane forest loss 00-05
- montane forest loss 05-10
- montane forest loss 10-12
- wetland forest degradation 00-05
- wetland forest degradation 05-10
- wetland forest degradation 10-12
- lowland forest degradation 00-05
- lowland forest degradation 05-10
- lowland forest degradation 10-12
- montane forest degradation 00-05
- montane forest degradation 05-10
- montane forest degradation 10-12

Margono et al., 2014,
Primary forest cover loss in Indonesia, 2000 to 2012,
Nature Climate Change

15.1.1 Forest Area as a proportion of total land area (global forest cover)

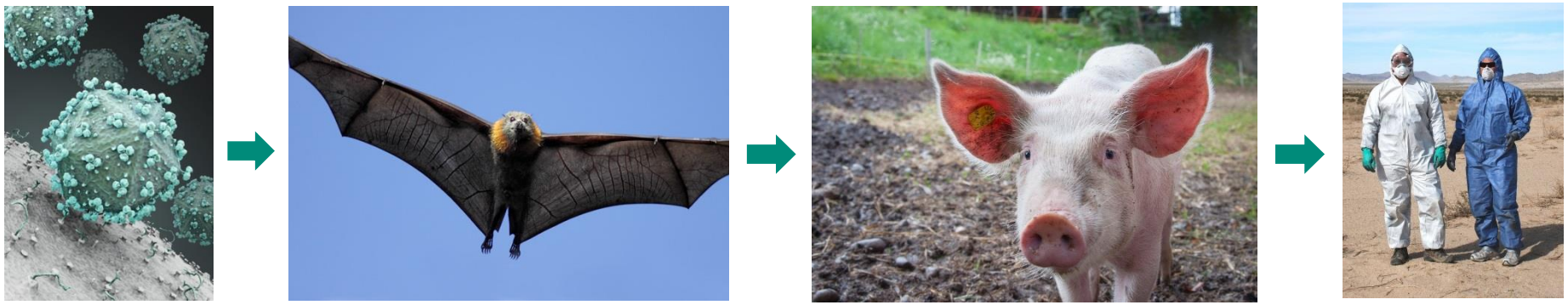
BHI Biodiversity Habitat Index



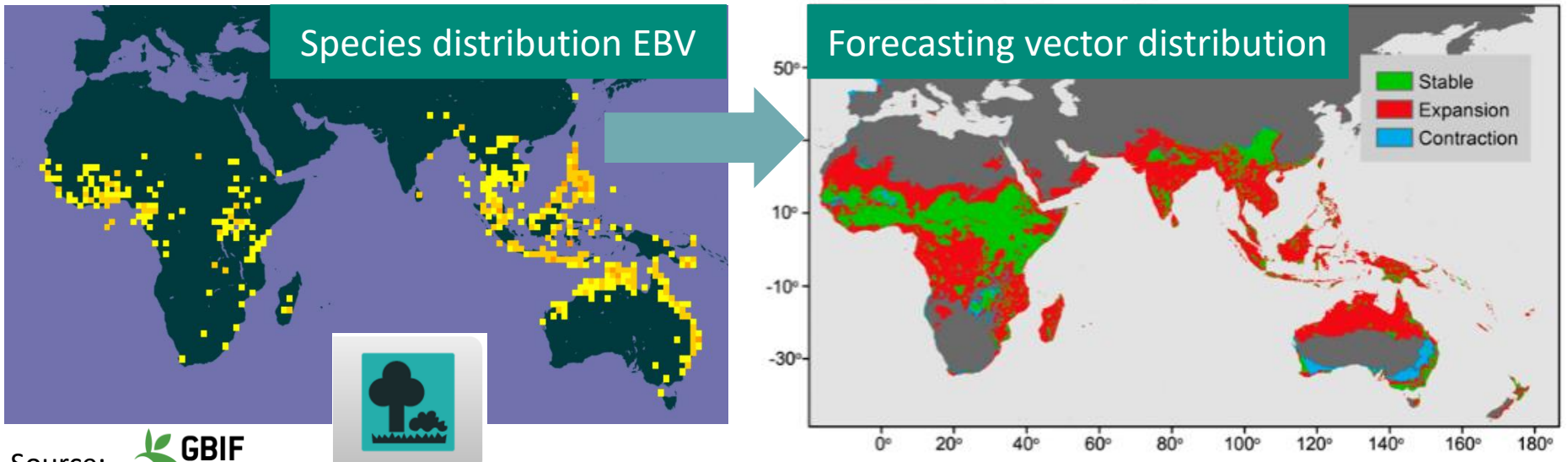
Ferrier et al. manuscript

Integrating health, climate and biodiversity data to forecast future potential for zoonotic disease transmission

The example of the Nipah virus



Pteropus poliocephalus source: EOL

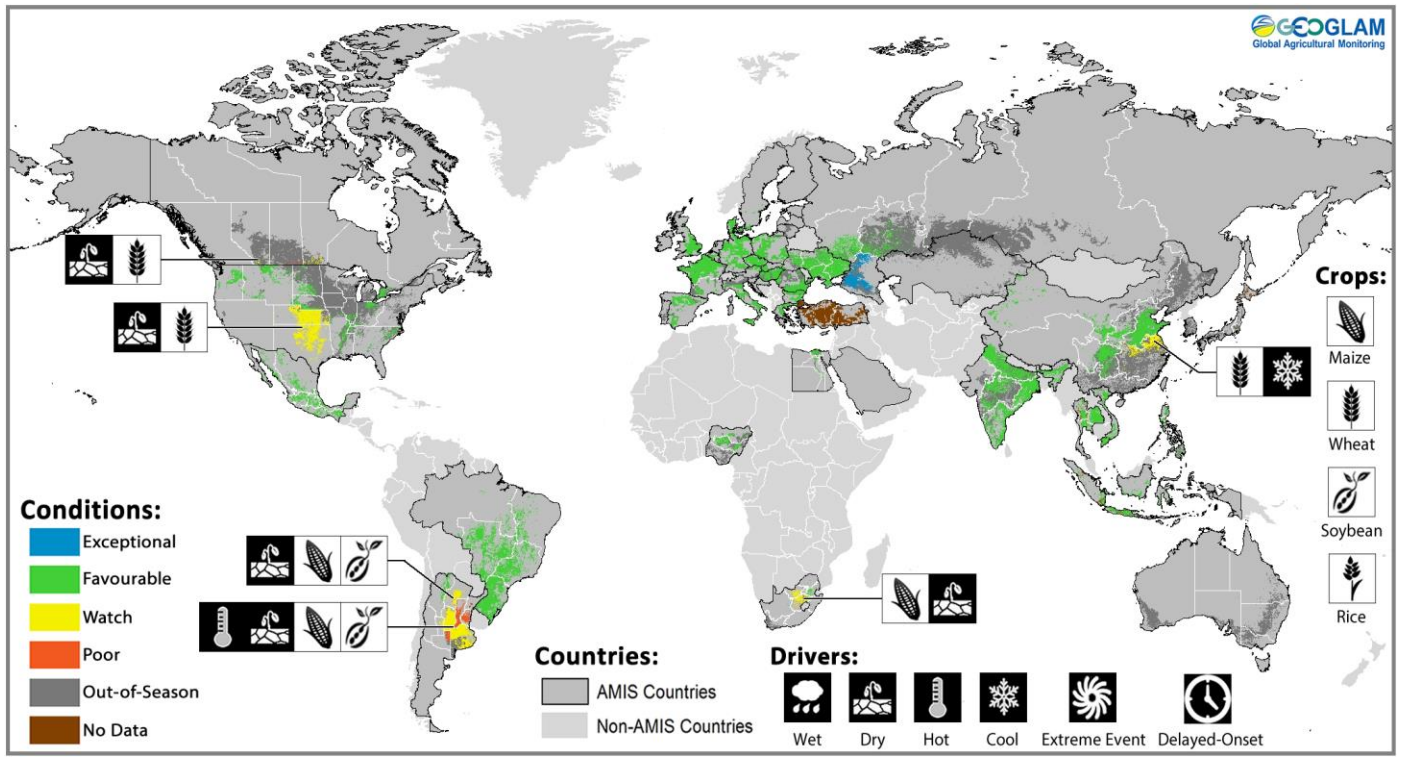


Source: GBIF Global Biodiversity Information Facility

Source: Daszak et al. 2013, PNAS

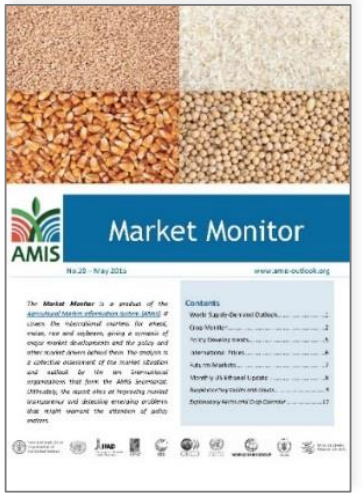
End hunger, achieve food security and improved nutrition and promote sustainable agriculture

Condition Synthesis Maps Covering All AMIS Crops



Crop conditions and drivers are shown as of February 28. Crops that are in other than favorable conditions are displayed on the map with their crop symbol & driver.

https://cropmonitor.org/



Market Monitor: Operational monthly bulletin for primary crop types for 49 countries

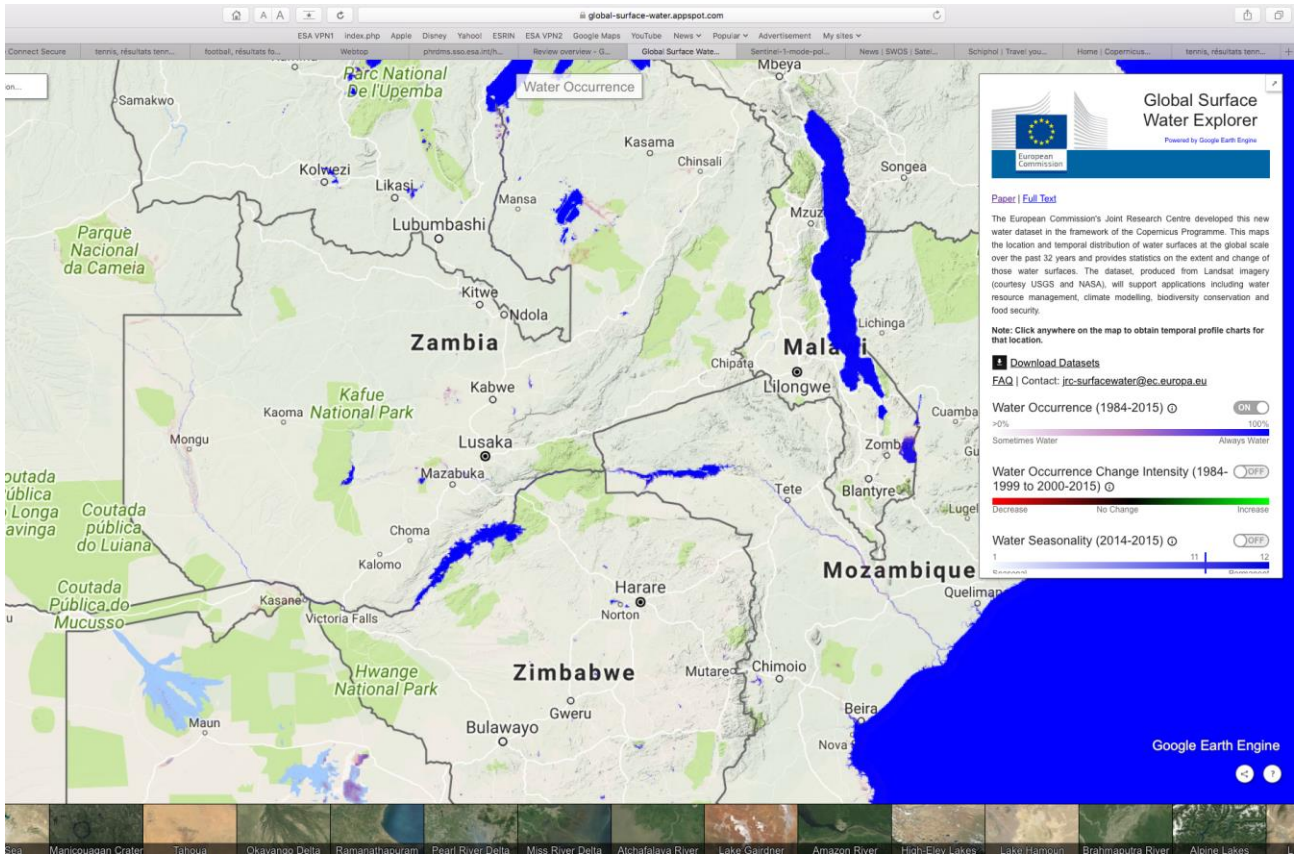
Four main crops: Rice, Wheat, Maize, Soybeans

EO Data Use

- Satellite baseline datasets - GEOGLAM Crop Calendars and Crop Masks
- Satellite observations of land - NASA & USGS (MODIS, Landsat, SMAP), ESA (Sentinel-1, Sentinel-2, Sentinel-3), CSA (Radarsat-2, RCM), JAXA (GCOM-C, ALOS-2), DLR (TerraSAR-X, TanDEM-X), CNES (Pleiades)
- In-situ & agrometeorological data sets
- Novel crowd-sourced information – GEO WIKI

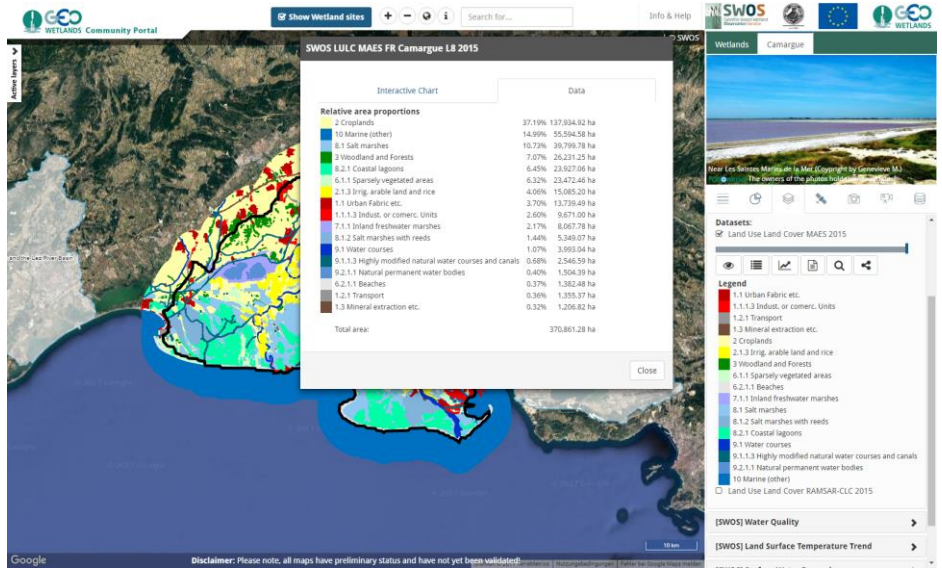
Earth observations for water-related ecosystem monitoring

High quality Global Data Set on spatial extent of inland water bodies (1984-2015, full Landsat archive, 30m, Joint Research Center supported by Google Earth Engine)



Water-related Community Portal

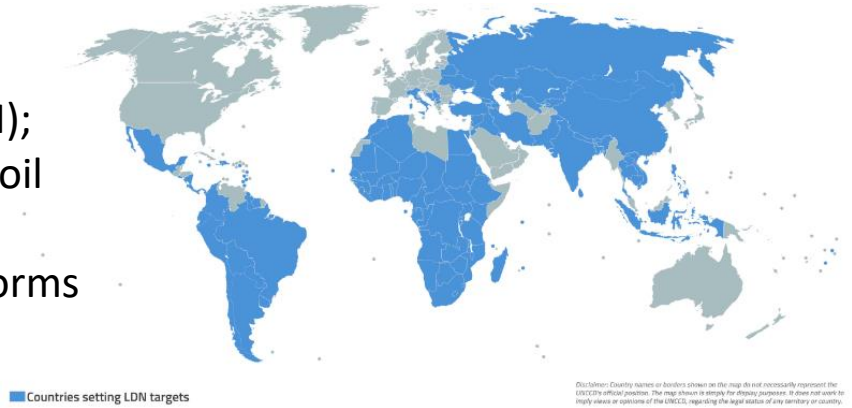
- Wetland-related datasets freely available
- EO best case practices & guidelines
- Portal customization for SDG 6 monitoring & reporting



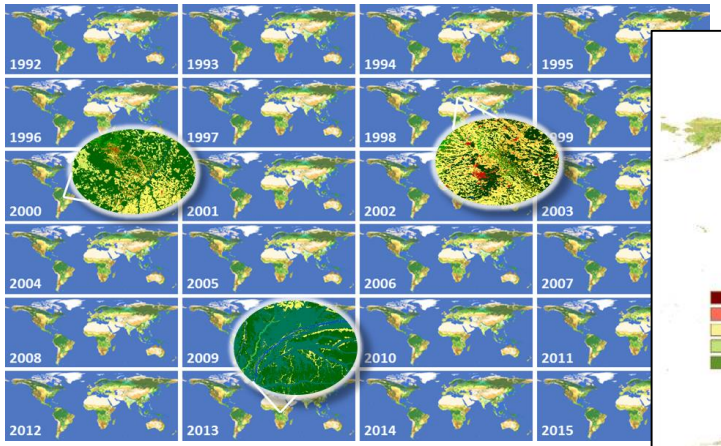
15.3.1. Proportion of land that is degraded over total land area

United Nations Convention to Combat Desertification

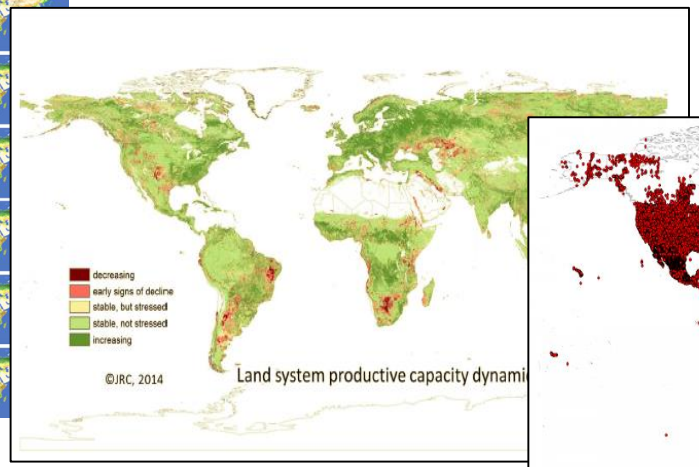
- Good Practice Guidance produced by UNCCD
- National official data sources, complemented by EO.
- EO Data: Land Cover – NASA (Landsat, MODIS),USGS (Landsat), ESA (Land Cover CCI); Land Productivity Dynamics (LPD) – JRC; Soil Organic Carbon (SOC) - International Soil Reference and Information Centre
- UNCCD - GEO regional capacity building workshops & federated collaborative platforms



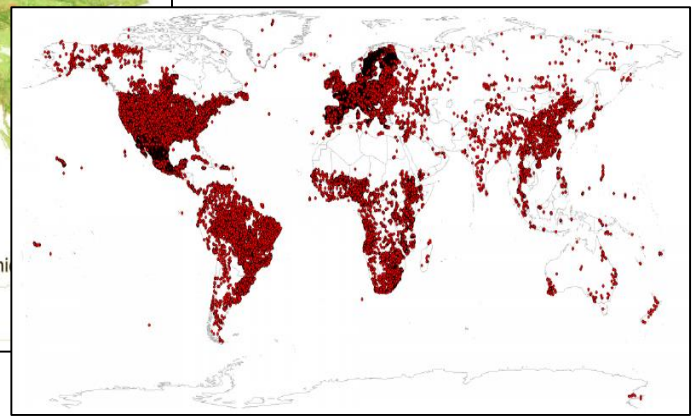
Out of the 113 countries that have committed to set LDN targets, 64 countries have already established a baseline



ESA Climate Change Initiative Land Cover



JRC Land Productivity Dynamics



ISRIC SoilGrids250m

JOINT RESEARCH CENTRE

ISRIC World Soil Information

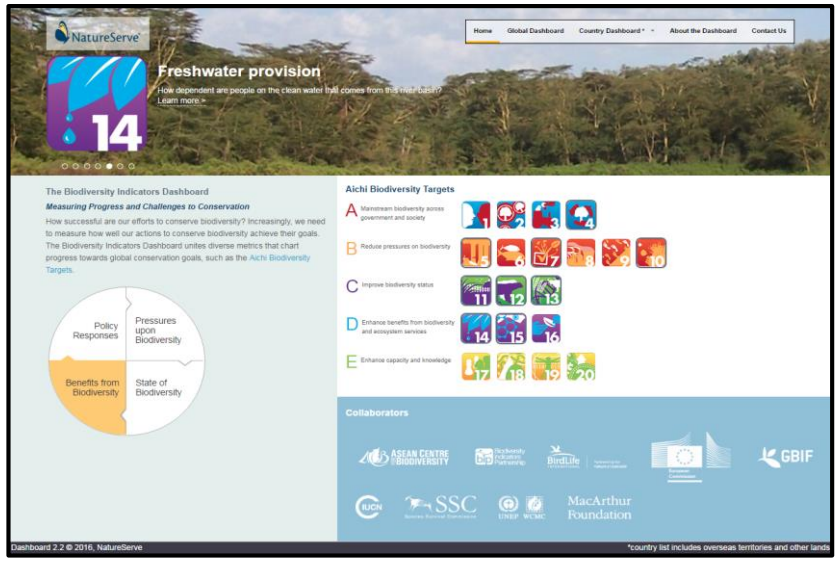
GEO BON

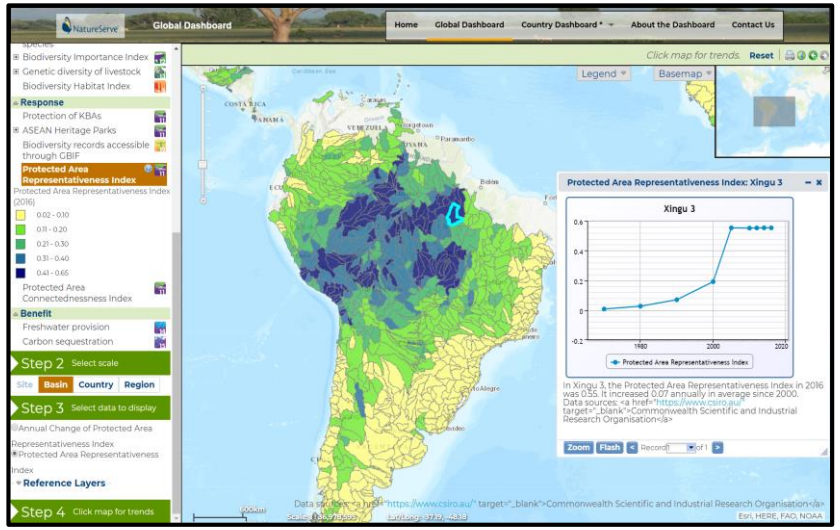
EARTH OBSERVATIONS FOR THE SUSTAINABLE DEVELOPMENT GOALS

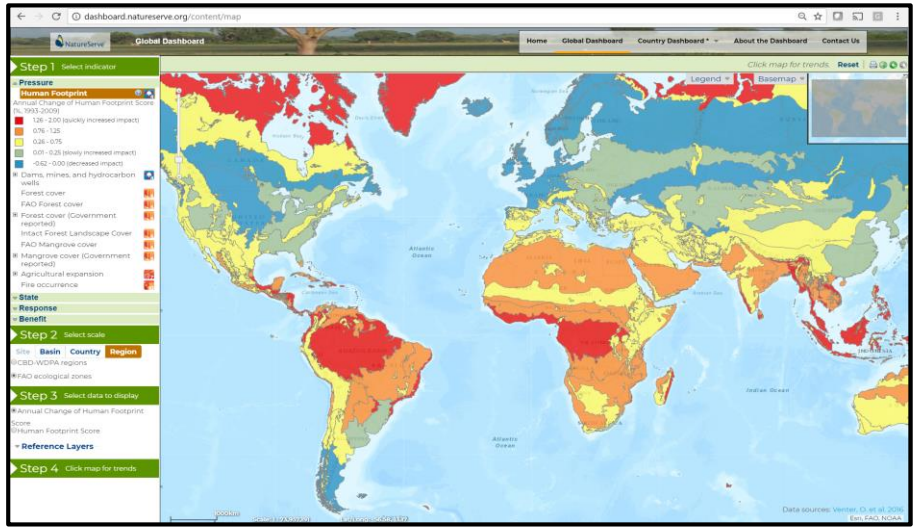
GEOGLAM Global Agricultural Monitoring

GFOI Global Forest Observations Initiative

NatureServe Indicators Dashboard: Intuitive data visualization to quickly convey essential information



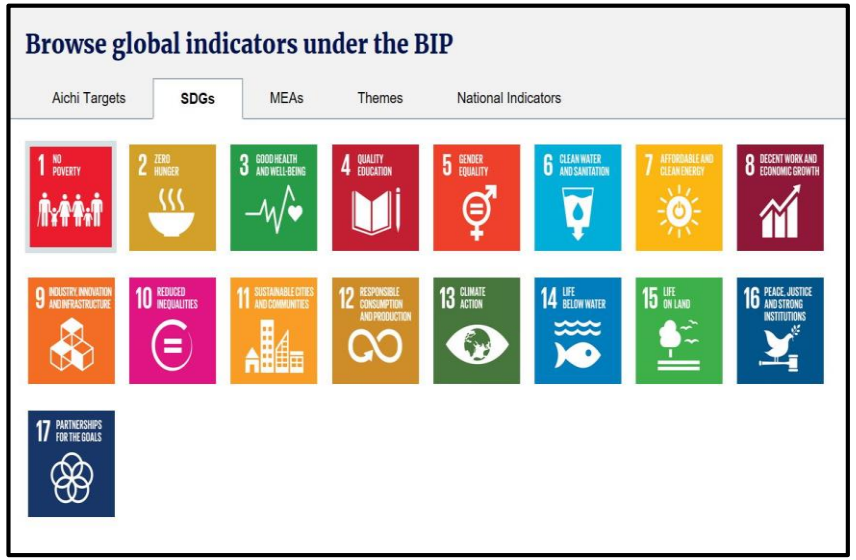


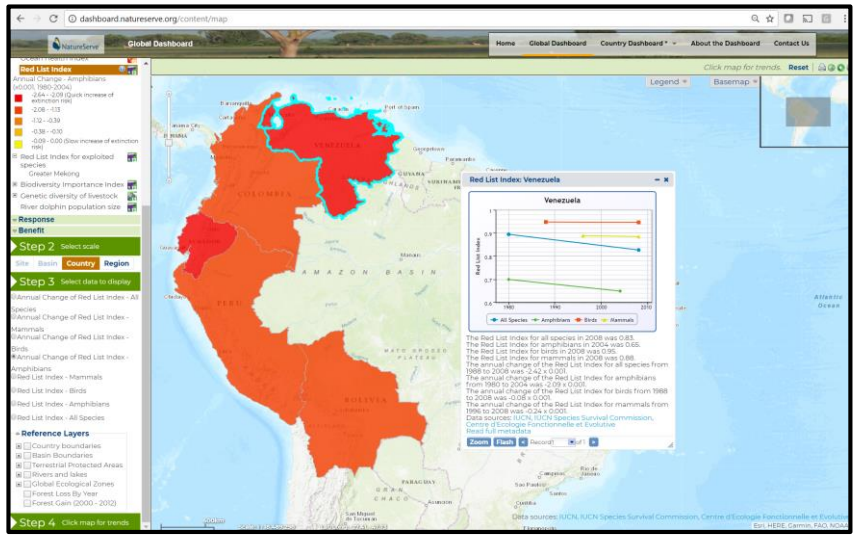


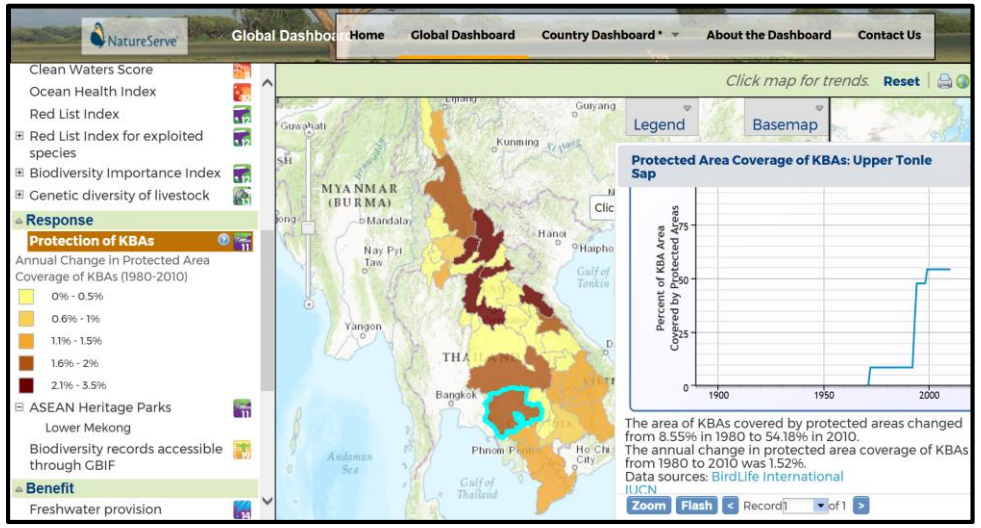
http://dashboard.natureserve.org/

NatureServe

Biodiversity Indicators Partnership Visualization Facility: creating a user-friendly and interactive indicator visualizations for the SDGs







UN environment WCMC

bip Biodiversity Indicators Partnership

NatureServe