Global Earth observations for impact

Geospatial Information for Sustainable Development

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The 4Cs

Discover, access and use open data

Capacity
Digital literacy, policy & technology translation,
co-design and co-production of knowledge

Communications
Awareness raising, free resources,
training schedules and venue

Collaboration
Community, human interoperability & regions

Commercial
Public Private Partnerships, platform & pricing

Group on Earth Observations

About us

What is GEO?

GEO is an intergovernmental partnership working to improve the availability, access and use of Earth observations globally.

GROUP ON
EARTH OBSERVATIONS

7 continents

8 societal benefit areas

12 years

73 work programme activities

105 member governments

126 participating organizations

7,000 data providers

400,000,000 Earth observations

Group on Earth Observations

Intergovernmental partnership

How does GEO work?

GEO works to improve the availability, access, understanding and use of Earth observations for the benefit of society.
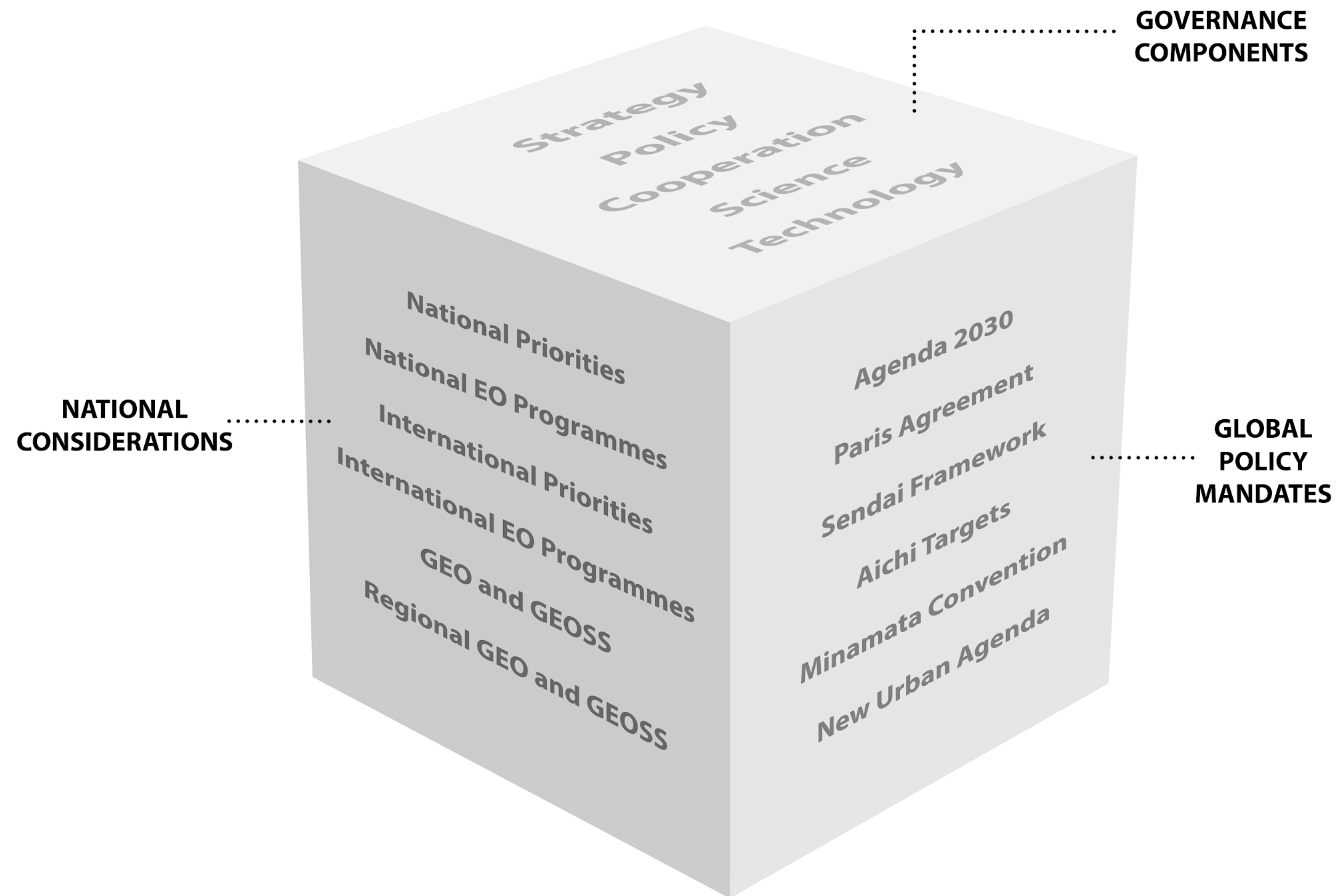
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GEO's **global engagement priorities** include supporting the UN 2030 Agenda for Sustainable Development, the Paris Agreement on Climate and the Sendai Framework for Disaster Risk Reduction. In particular, the intersection, overlap and shared monitoring and reporting requirements to achieve the respective goals and objectives.

POLICY CUBE:
EARTH OBSERVATIONS IN NATIONAL PLANNING

GOVERNANCE COMPONENTS

Strategy
Policy
Cooperation
Science
Technology

National Priorities
National EO Programmes
International Priorities
International EO Programmes
GEO and GEOSS
Regional GEO and GEOSS

Agenda 2030
Paris Agreement
Sendai Framework
Aichi Targets
Minamata Convention
New Urban Agenda

NATIONAL CONSIDERATIONS

GLOBAL POLICY MANDATES

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GEO Work Programme 2017-2019

70+:FLAGSHIPS, INITIATIVES & COMMUNITY ACTIVITIES

SCORES OF COUNTRIES

THOUSANDS OF COLLABORATORS

HUNDREDS OF $MILLIONS INVESTED

IMPACT ON **BILLIONS** OF LIVES

Group on Earth Observations

Flagships and initiatives

GEO BON GEO Biodiversity Observation Network	GEOGLAM GEO Global Agricultural Monitoring	GFOI Global Forest Observation Initiative	GOS4M Global Observation System for Mercury
AfriGEOSS Reinforcing Regional African Engagement	AmeriGEOSS	AOGEOSS Asia-Oceania GEOSS	Aquawatch	Climate Change Impact Observation on Africa's Coastal Zones
GEO-DARMA Data Access for Risk Management	EO4EA Earth Observations for Ecosystem Accounting	EO4SDG Earth Observations in Service of the 2030 Agenda for Sustainable Development	EuroGEOSS	GEO Carbon and GHG Initiative
GEOCRI GEO Cold Regions Initiative	GNSL GEO Geohazard Supersites and Natural Laboratories	GEO ECO GEO Global Ecosystem Initiative	GEO-GNOME Global Network for Observation and Information in Mountain Environments	GEOGLOWS GEO Global Water Sustainability
GEO Human Planet Initiative	GEOSS-EVOLVE	GEO LDN GEO Land Degradation Neutrality	GEO VENER GEO Vision for Energy	GEO Wetlands Initiative
GDIS Global Drought Information System	GOS4POPS Global Observations System for Persistent Organic Pollutants	Global Urban Observation and Information	GWIS Global Wildfire Information System	Ocean and Society: Blue Planet

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Earth Observations & the SDGs

Earth observations play a major role in achieving the SDGs.

Earth observations are used for monitoring goals, targets and indicators, tracking progress and helping countries and custodial agencies make decisions and ongoing adjustments.

SUSTAINABLE DEVELOPMENT GOALS

	Population distribution	Cities and infrastructure mapping	Elevation and topography	Land cover and use mapping	Oceanographic observations	Hydrological and water quality observations	Atmospheric and air quality monitoring	Biodiversity and ecosystem observations	Agricultural monitoring	Hazards, disasters and environmental impact monitoring
1 No poverty										
2 Zero hunger										
3 Good health and well-being										
4 Quality education										
5 Gender equality										
6 Clean water and sanitation										
7 Affordable and clean energy										
8 Decent work and economic growth										
9 Industry, innovation and infrastructure										
10 Reduced inequalities										
11 Sustainable cities and communities										
12 Responsible consumption and production										
13 Climate action										
14 Life below water										
15 Life on land										
16 Peace, justice and strong institutions										
17 Partnerships for the goals										

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EARTH OBSERVATIONS FOR THE SUSTAINABLE DEVELOPMENT GOALS

GEO Initiative:

Earth Observations for the Sustainable Development Goals (EO4SDG)

EO4SDG is a GEO Initiative working to organize and realize the potential of Earth observations and geospatial information to advance the UN 2030 Agenda through collaboration with statistical community, national statistical offices, line ministries and custodian agencies. EO4SDG is currently focused on addressing four SDGs:

Initiative Co-Chairs
Olivia Jimena Juarez Carrillo, Mexico (INEGI)
Chu Ishida, Japan (JAXA)
Lawrence Friedl, USA (NASA)

Executive Secretary
Argyro Kavvada, USA (NASA-BAH)

www.eo4sdg.org
@EO4SDG

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Stakeholder Engagement
UN-GGIM

Digital Earth AFRICA

Steering Committee

- Australia
- Ghana
- Kenya
- South Africa
- CEOS
- GEO Secretariat
- GPSDD
- WEF
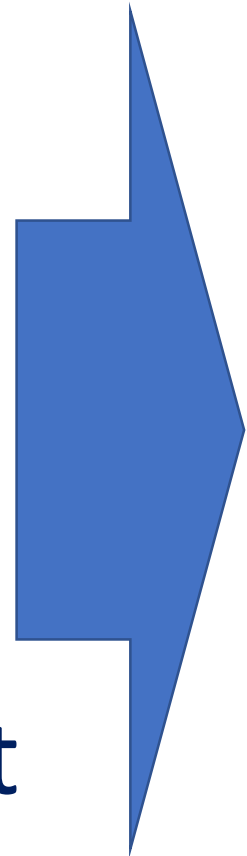
Key activities

- Institutional arrangements
- Political buy-in
- Technical infrastructure
- Capacity building
- Long-term sustainability
- Financial models
- Connecting to other initiatives and solutions

People & policy

- AfriGEOSS
- UN-GGIM
- GMES for Africa
- SERVIR
- SDGs
- Agenda 2063
- GRID3
- Other platforms (radiant.earth, Africa GeoPortal, Google Earth Engine, value added services and products)

UN-GGIM

- AfriGEOSS
- EO4SDG
  - ✓ UNCCD
    - 15.3.1
  - ✓ UN ECA
  - ✓ UN ENVIRONMENT
    - 6.3.2
    - 6.6.1
    - 14.1.1
  - ✓ UNFCCC
  - ✓ UN-HABITAT
    - 11.3.1
  - ✓ UNISDR

SDG 6.3.2 - Water Quality

Year 2016
Maximum TSM

0 - 10	80 - 100
10 - 20	100 - 120
20 - 40	120 - 140
40 - 60	140 - 160
60 - 80	160 - 180
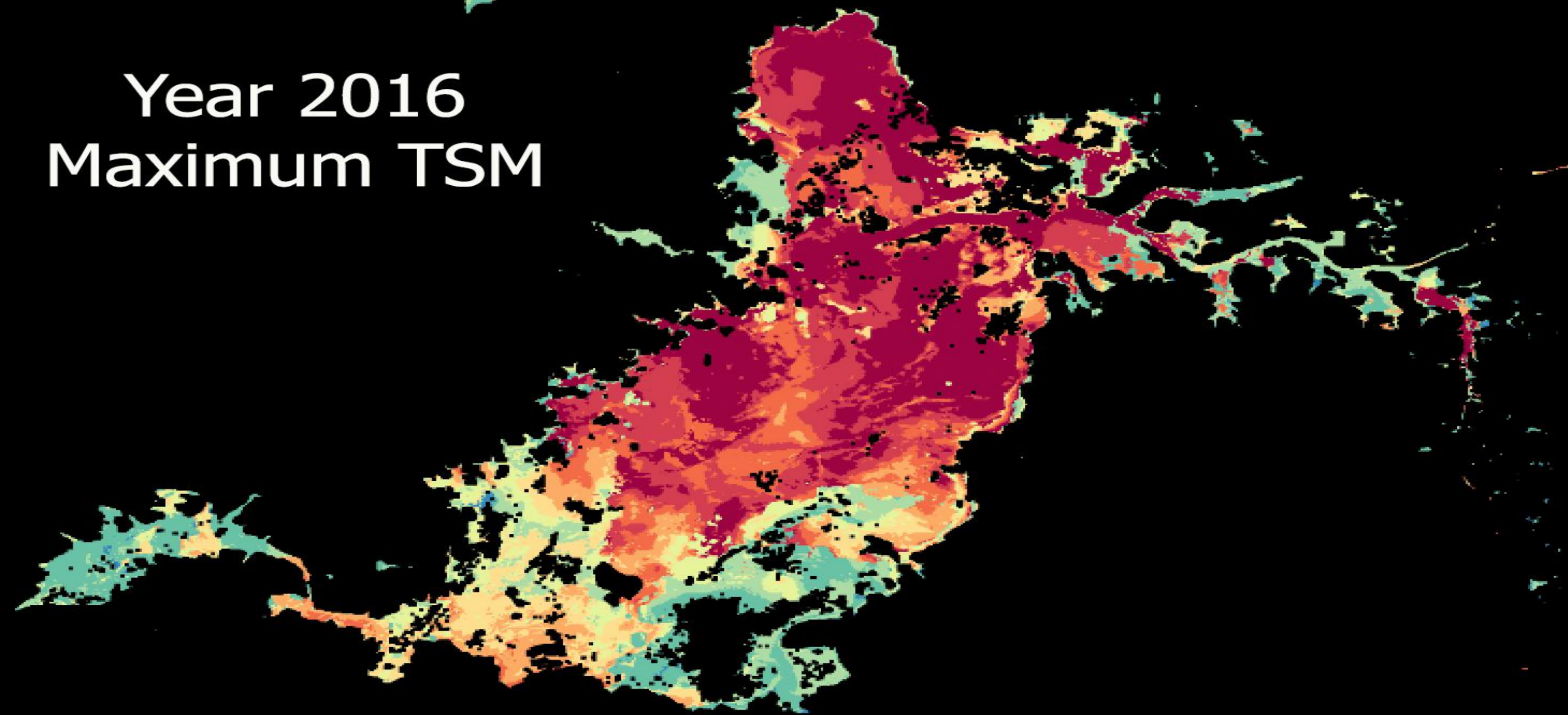
Total Suspended Matter (TSM) is an indicator of water condition. This reservoir supplies drinking water to millions of people in southern Vietnam.
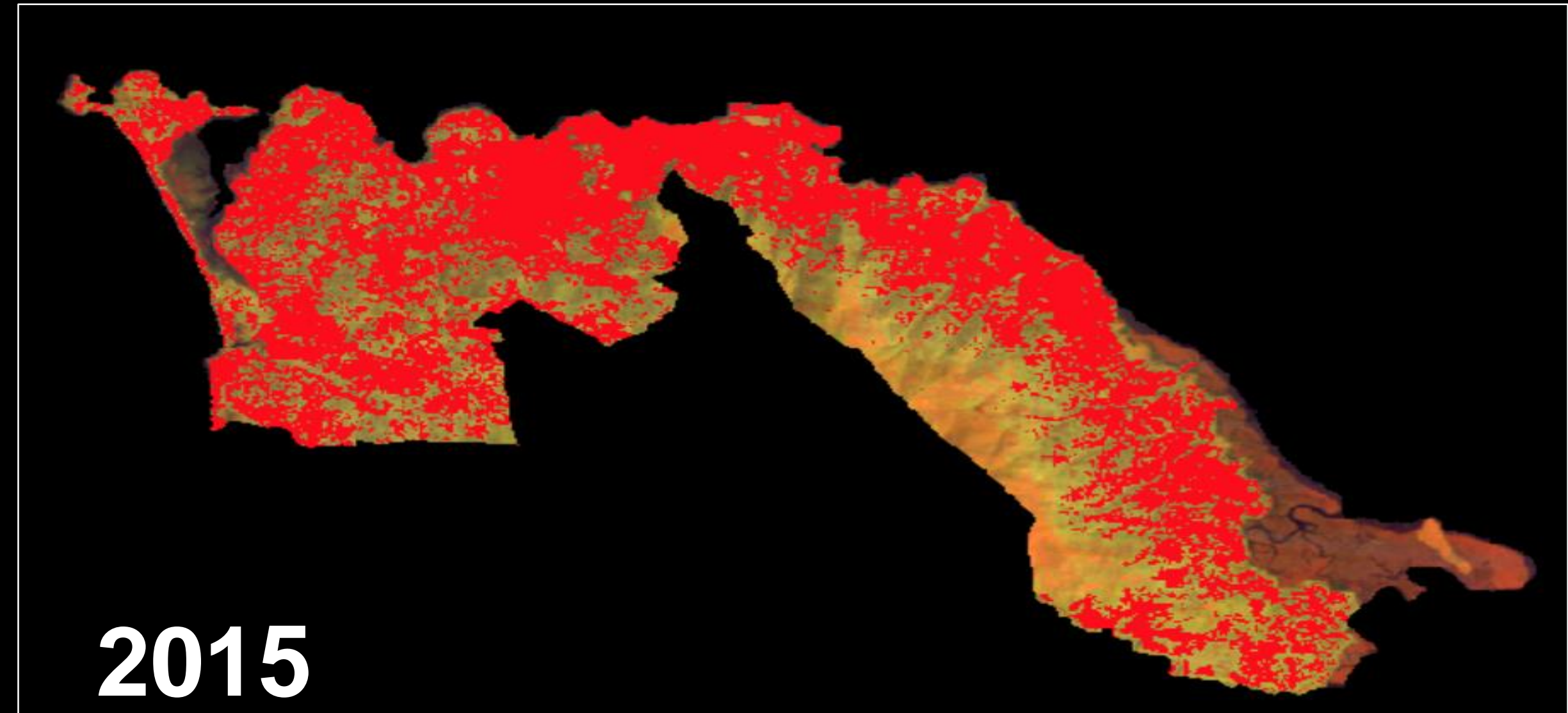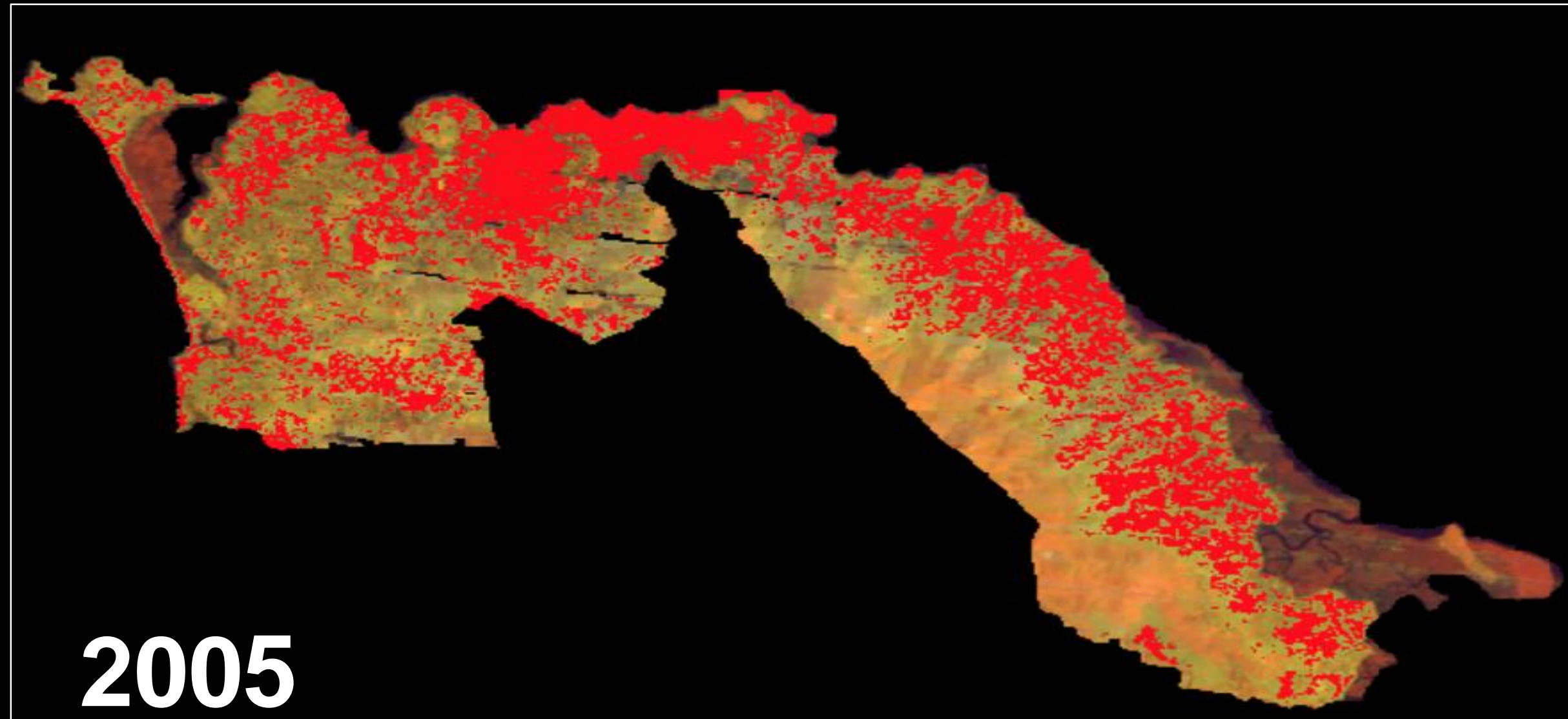
SDG 6.6.1 - Water Extent
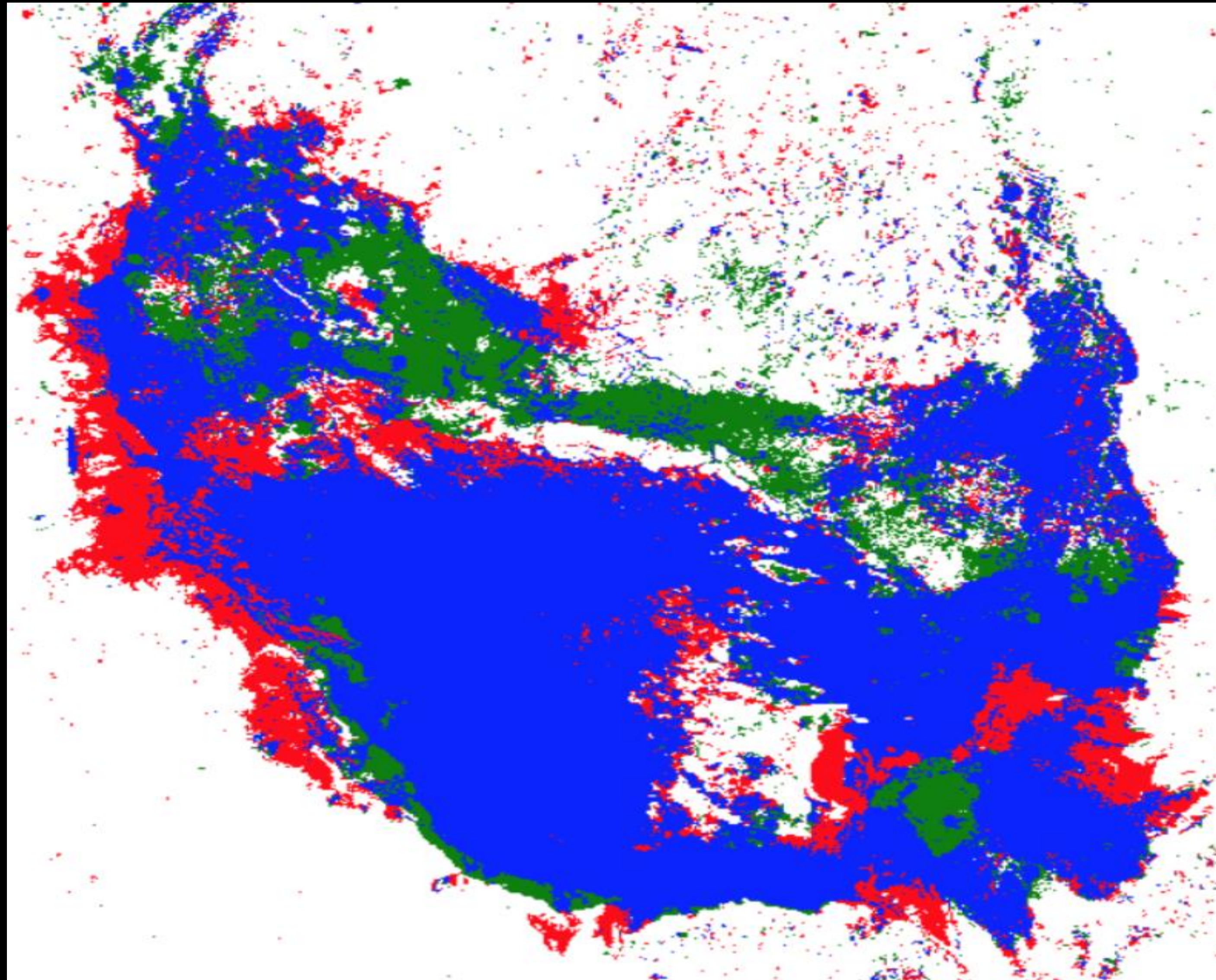
Lake Sulunga in Tanzania

From 2014 to 2018, there is a net loss of 3.8% of water pixels. This is considered an "Unmodified Natural" change or "Class-A".

Analysis followed the SDG 6.6.1a indicator methodology (20 Jan 2017) and used the Landsat WOFS water detection algorithm.

- No Water to No Water
- No Water to Water (green)
- Water to No Water (red)
- Water to Water (blue)
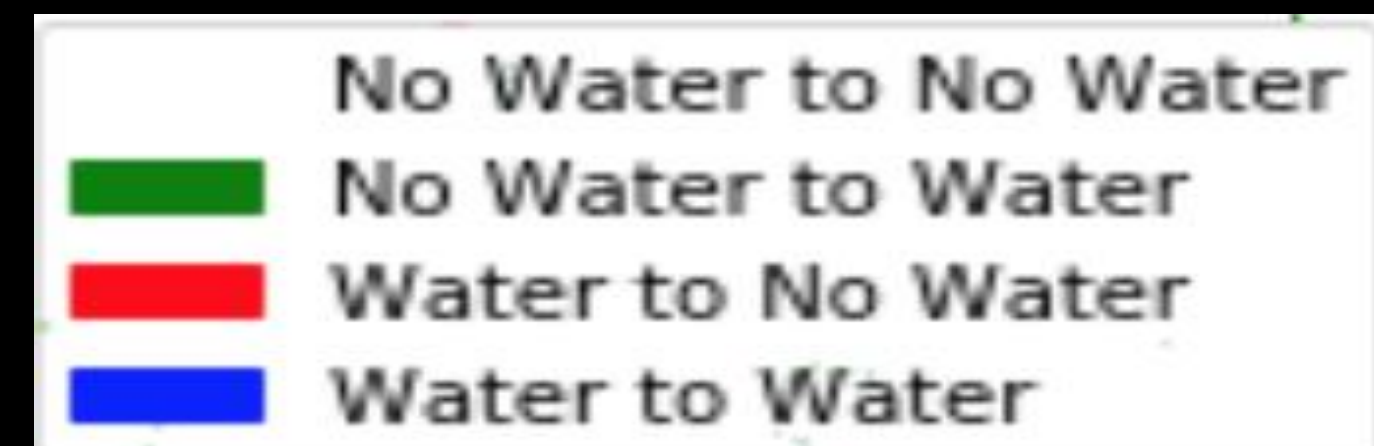
SDG 11.3.1 - Urbanization

2005

2015

Urbanization in Freetown, Sierra Leone – 2005 to 2015
Urban Growth = U = 4.8% per year (Landsat-8 NDBI, 0.3 threshold)
Population Growth = P = 3.0% per year (GPWv4 data)
SDG 11.3.1 Indicator = (U/P) = 1.58

What does this tell us? People are rapidly moving out of the cities and taking over more land.
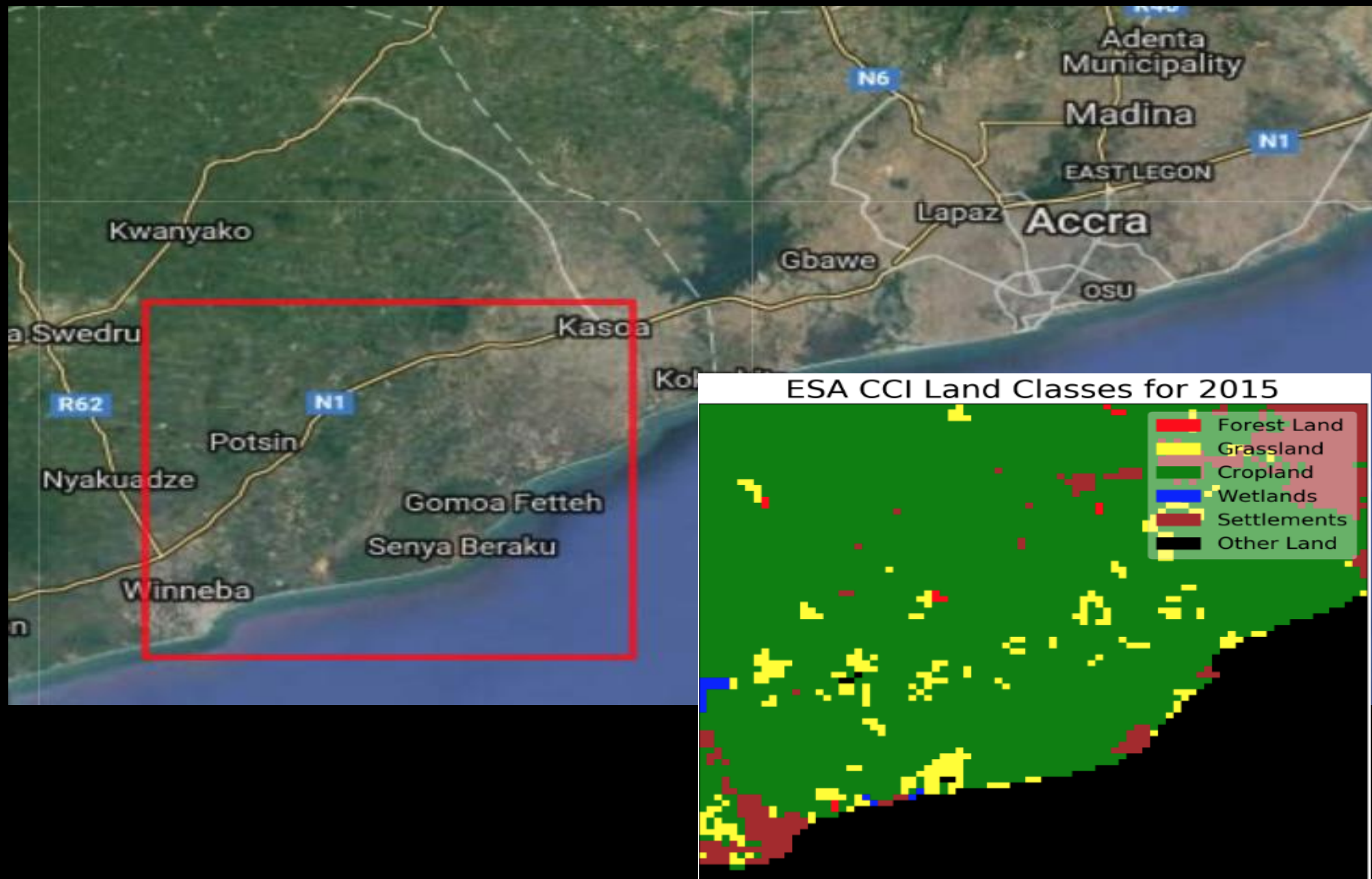*Analysis used the SDG 11.3.1 indicator formulas proposed by UN-HABITAT.*

SDG 15.1.1 – Forest Area
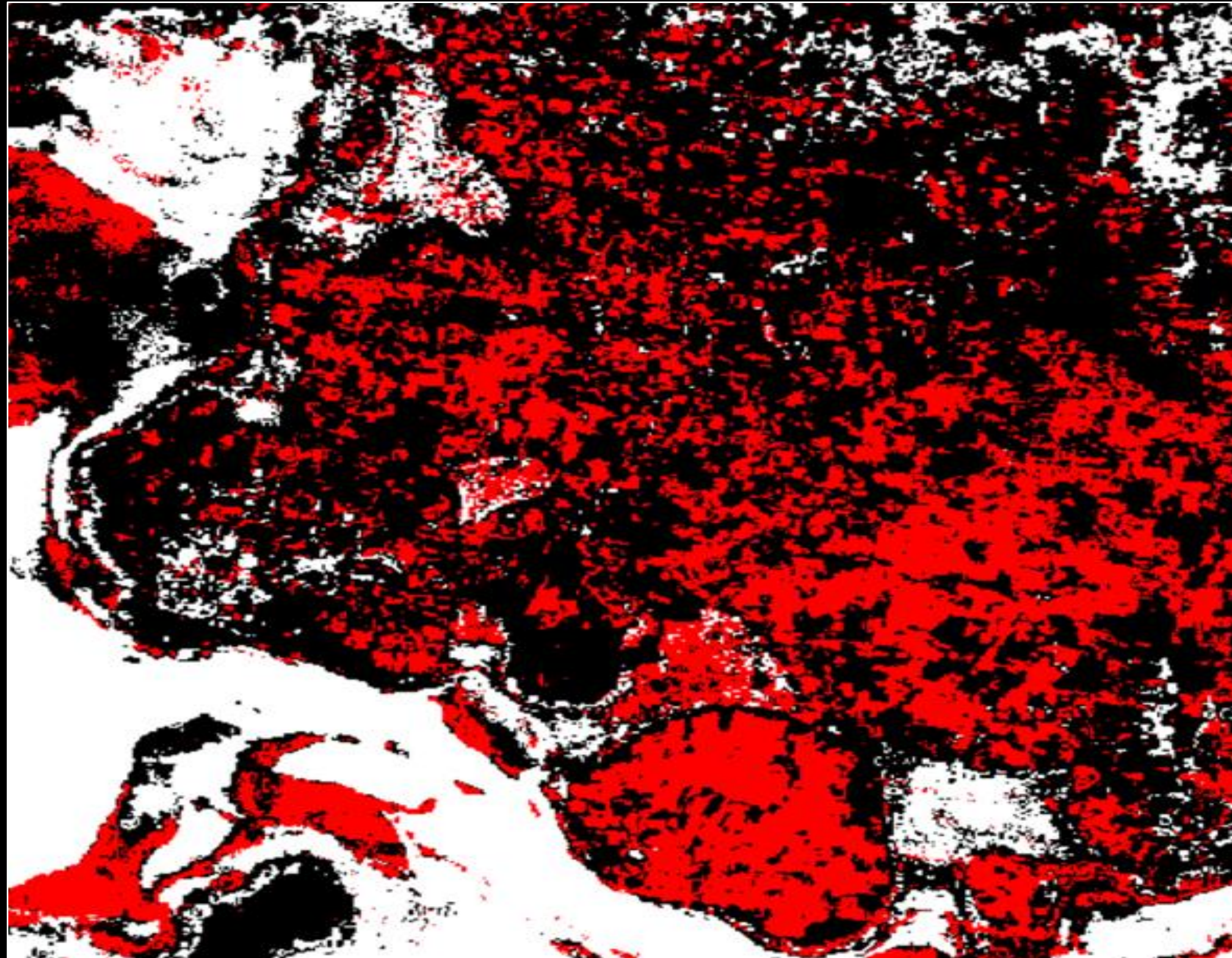
Usinge Forest in western Tanzania
The results of the Data Cube (left) can be compared with the Global Forest Watch product (right).

Using an NDVI threshold approach, there is a loss of 10.6%

SDG 15.3.1 – Land Degradation

ESA CCI Land Classes for 2015

Legend:
- Forest Land
- Grassland
- Cropland
- Wetlands
- Settlements
- Other Land

Change Matrix between Years 2000 and 2015

Original Class	Forest Land	Grassland	Cropland	Wetlands	Settlements	Other Land
Forest Land	0.14% Stable	0.00% Vegetation Loss	0.00% Deforestation	0.00% Inundation	0.00% Deforestation	0.00% Vegetation Loss
Grassland	0.01% Afforestation	3.70% Stable	0.00% Agricultural Expansion	0.00% Inundation	0.84% Urban Expansion	0.00% Vegetation Loss
Cropland	0.01% Afforestation	0.00% Withdrawl of Agriculture	61.68% Stable	0.00% Inundation	3.57% Urban Expansion	0.00% Vegetation Loss
Wetlands	0.00% Woody Encroachment	0.00% Wetland Drainage	0.00% Wetland Drainage	0.22% Stable	0.0_% Wetland Drainage	0.00% Wetland Drainage
Settlements	0.00% Afforestation	0.00% Vegetation Establishment	0.00% Agricultural Expansion	0.00% Wetland Establishment	1.22% Stable	0.00% Withdrawl of Settlements
Other Land	0.00% Afforestation	0.01% Vegetation Establishment	0.00% Agricultural Expansion	0.00% Wetland Establishment	0.04% Urban Expansion	28.52% Stable

4.4% Urban Expansion

Analysis completed along the coast of Ghana, near Accra.
ESA CCI data was used for land classification training.

Analysis used the SDG 15.3.1 Good Practice Guidance document by CSIRO and UNCCD (Sept 2017).
Assessment of Carbon stock was note addressed.

Outcome focus
Value of Earth observations

Outcomes

Action, impact and value

Global issues (SDGs, Sendai Framework, Paris Agreement, Minamata, New Urban Agenda etc.)

Funding

Usefulness

Usability

Policy, research and decision making

Integration

Processes, standards and business as usual
Census input and validation, trend analysis over time, etc.

Accessibility

Availability

Earth observations data and information , science and technology

Satellite and in situ data, Earth on AWS, AI for Earth, Google Earth Engine, Github, Pangea

GEO GROUP ON EARTH OBSERVATIONS

GEO Regional Initiatives

Commercial Sector Engagement

Contact Us

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#EO4SDG

Collaborate and communicate with GEO: