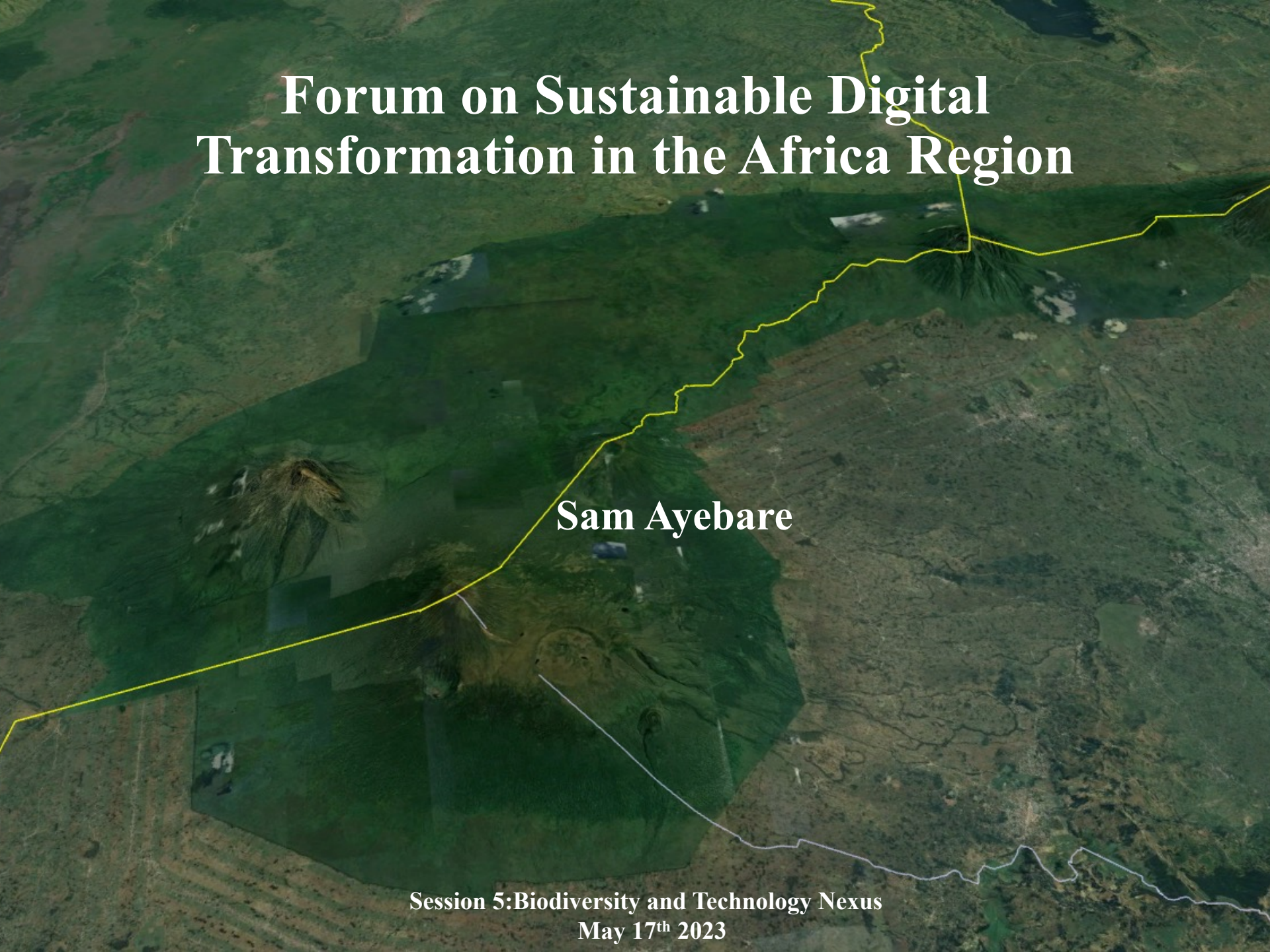
Forum on Sustainable Digital Transformation in the Africa Region



Sam Ayebare

Session 5:Biodiversity and Technology Nexus
May 17th 2023

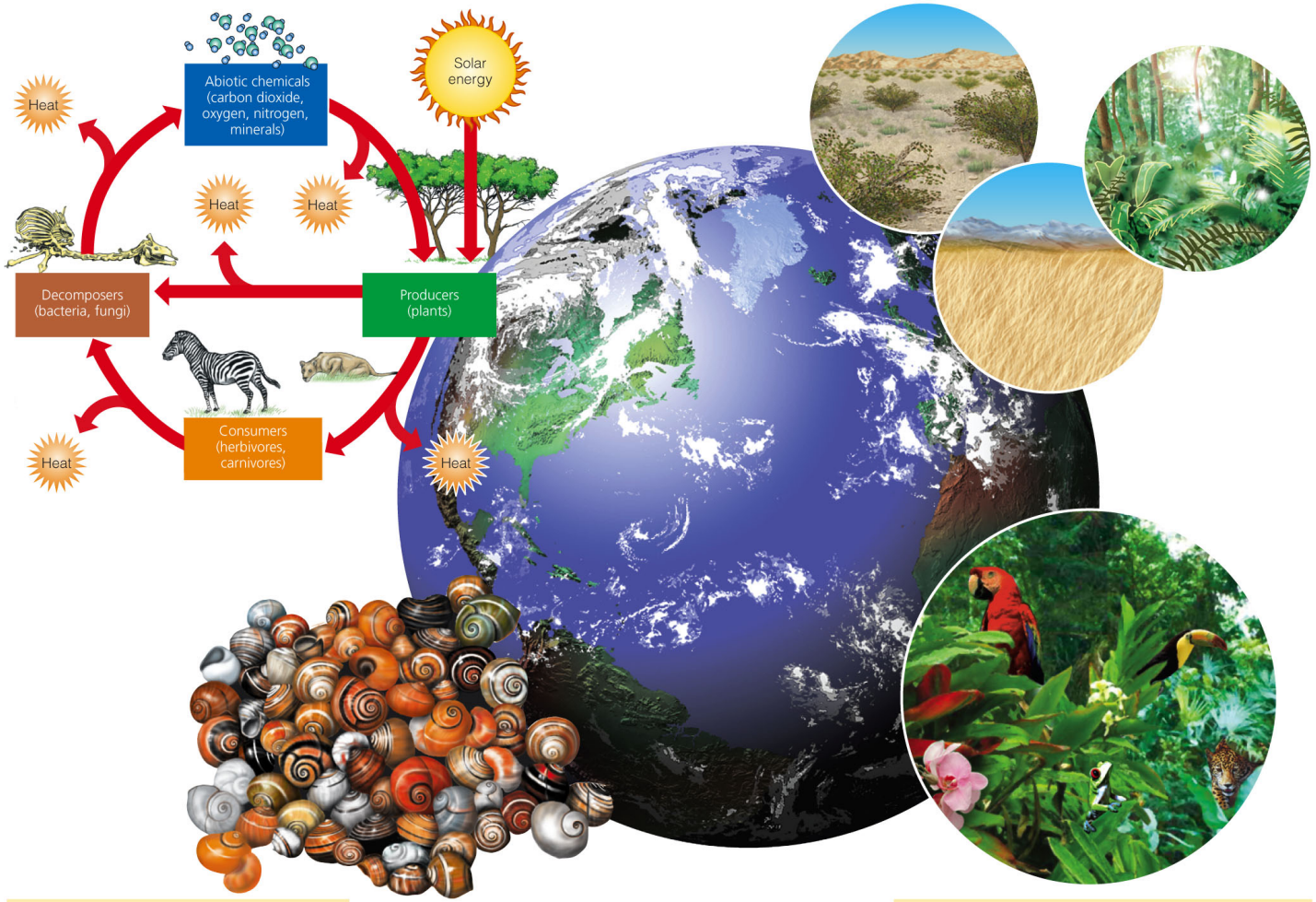
Objectives

- To highlight how ICTs and digital technologies can be harnessed for climate action and address the goals set out by COP15 on Biodiversity and UNFCCC COP27.

- To demonstrate the cross-sector collaboration in addressing ICT solutions positive and negative effects on biodiversity.

Functional Diversity
The biological and chemical processes such as energy flow and matter recycling needed for the survival of species, communities, and ecosystems.

Ecological Diversity
The variety of terrestrial and aquatic ecosystems found in an area or on the earth.

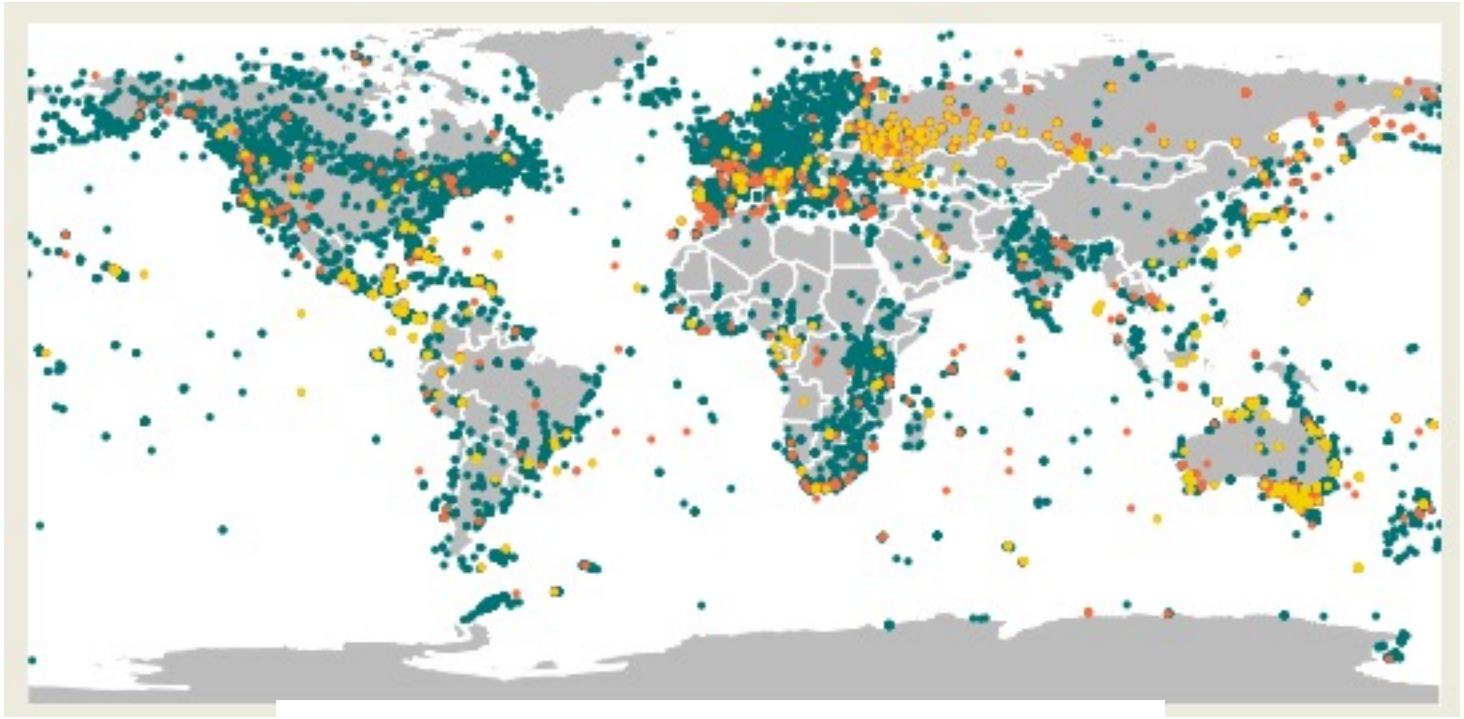


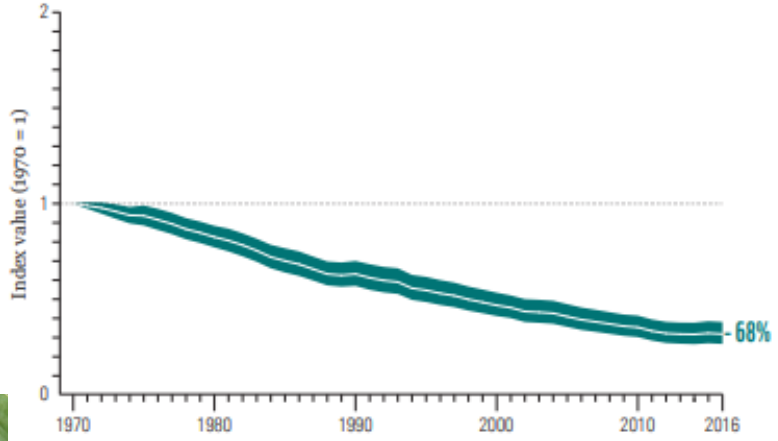
Genetic Diversity
The variety of genetic material within a species or a population.

Species Diversity
The number and abundance of species present in different communities.

Environmental science: G.Tyler Miller, Scott E. Spoolman

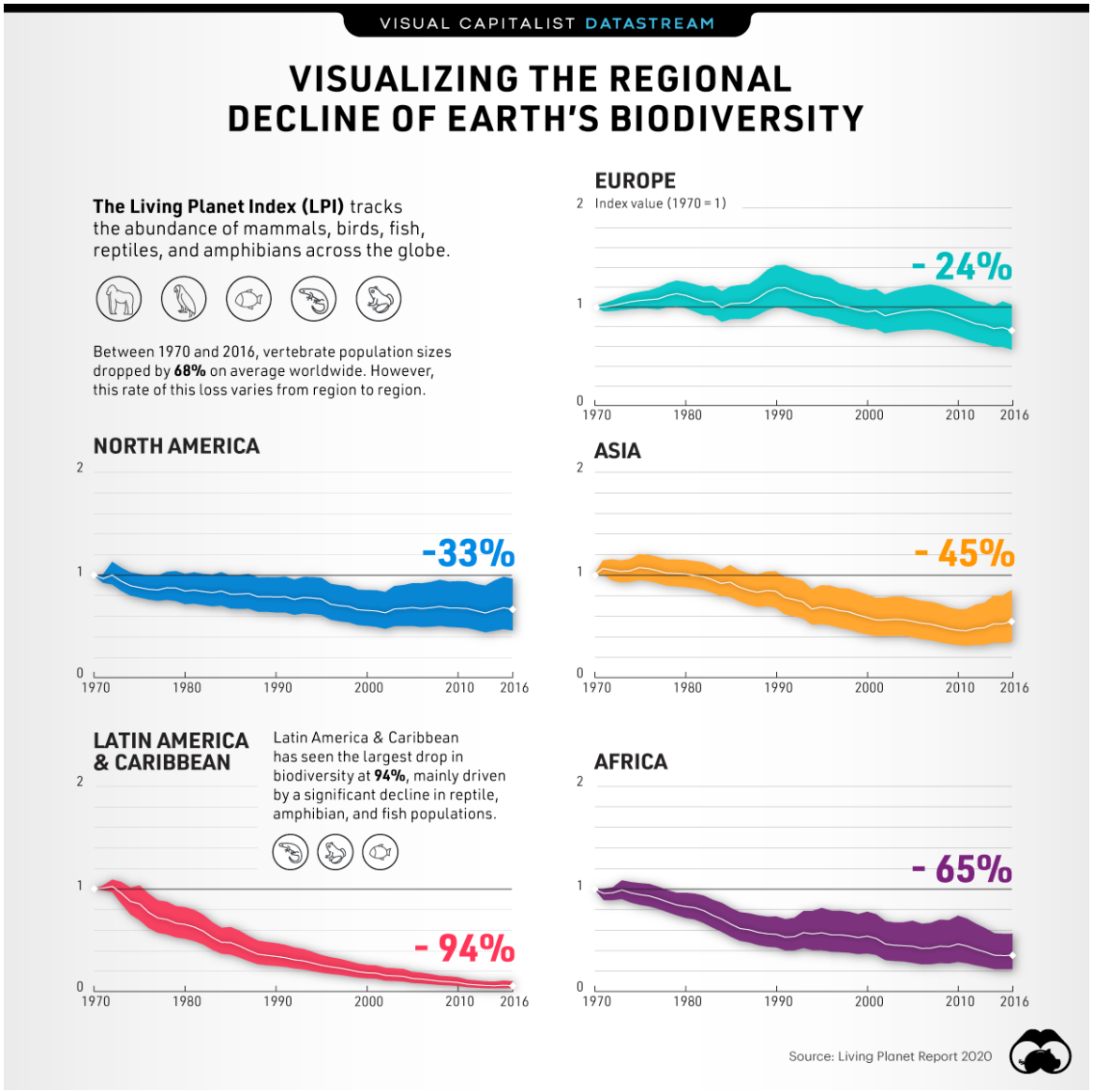
The Living Planet index

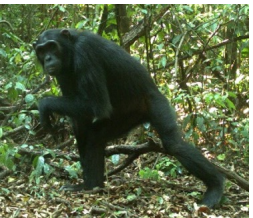




- Tracks abundance ~ 21,000 populations (mammals, birds, fish, reptiles , amphibians)

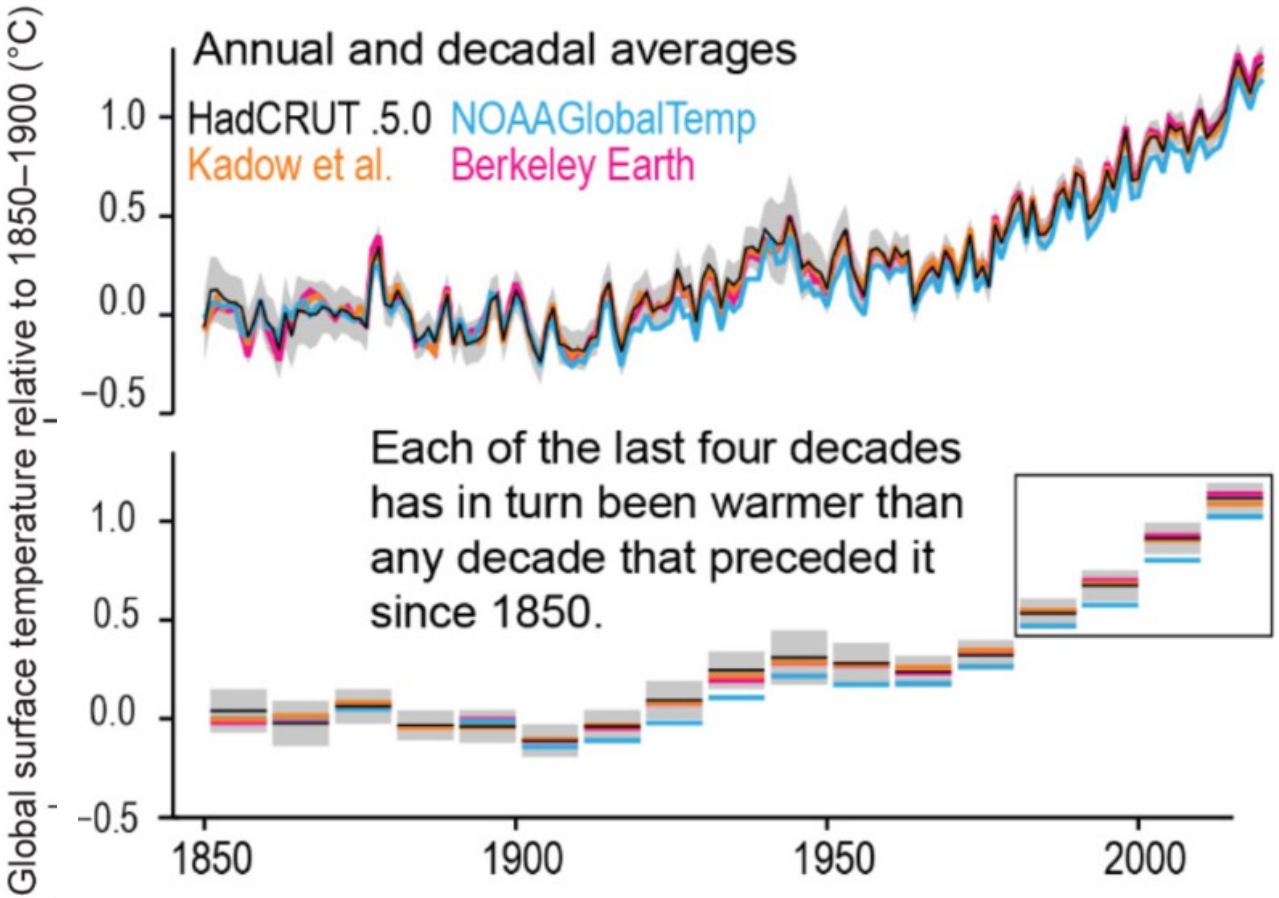
The Living Planet Index





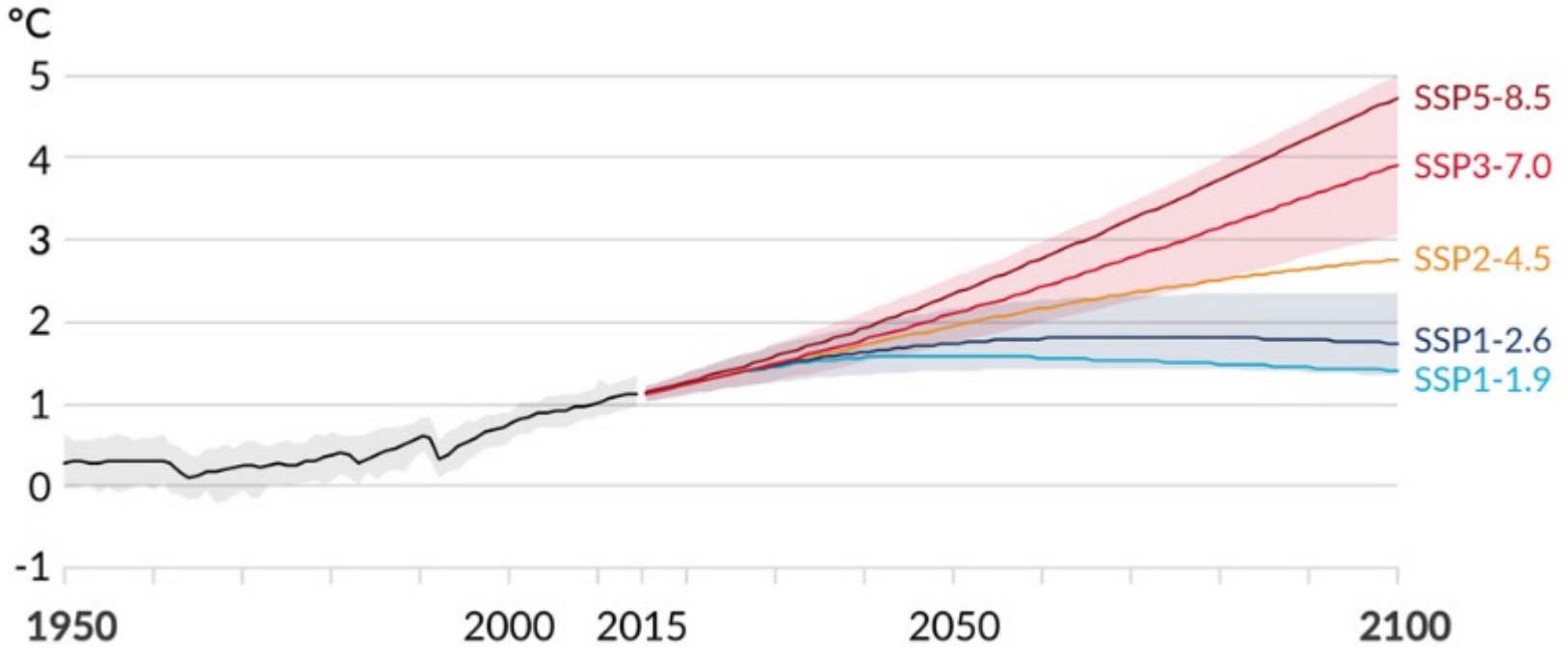
https://www.visualcapitalist.com/earths-biodiversity-loss-by-region/

Global surface average temperature (1850-2020)



Source: IPCC (2021) Figure 2.11c.

Global surface temperature changes relative to 1850-1900, degrees



Source: IPCC (2021) Figure SPM.8a.

Elephant ranging patterns

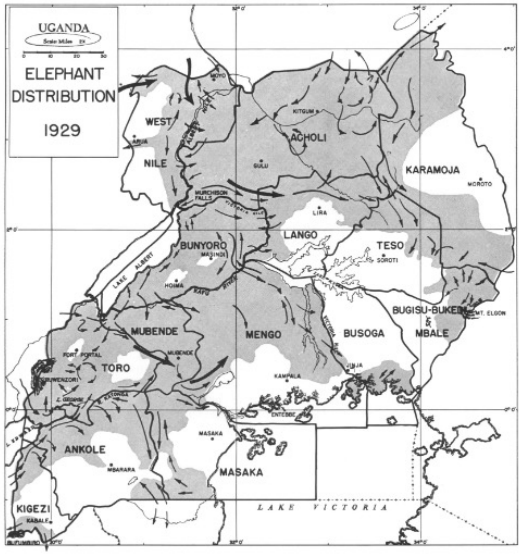


Fig. 2. Distribution and movements of elephants in Uganda, 1929.

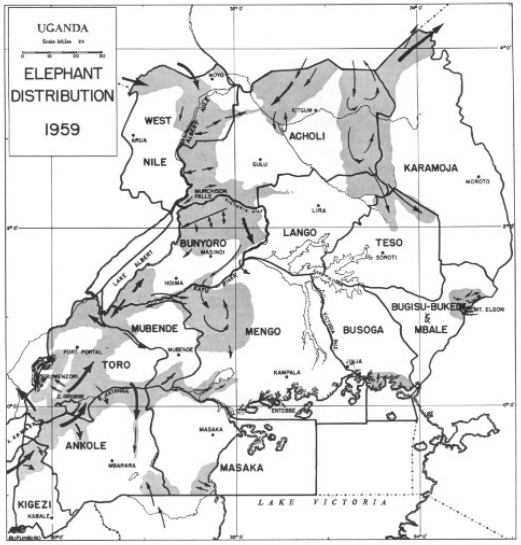


Fig. 3. Distribution and movements of elephants in Uganda, 1959.

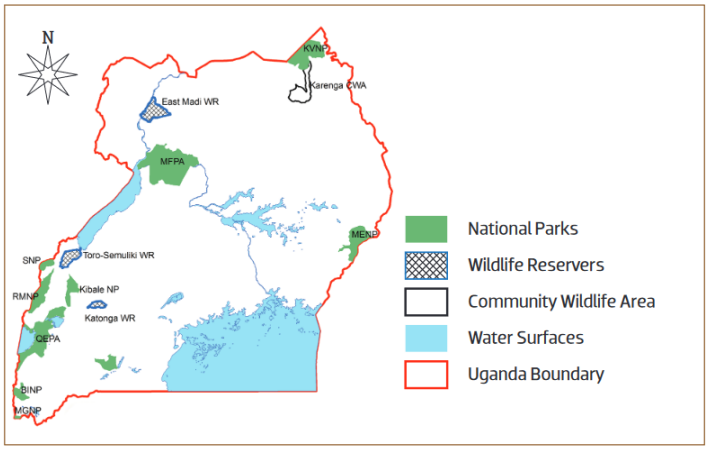


Figure 2. Uganda's Major elephant Protected Areas

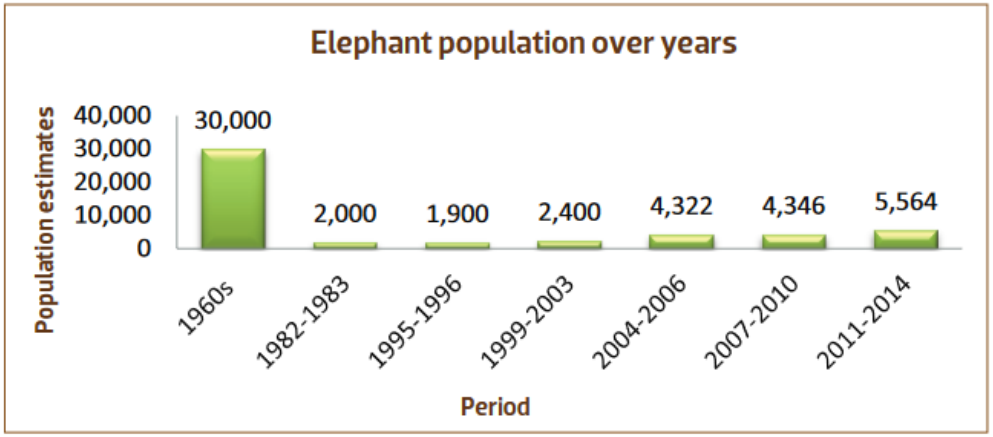
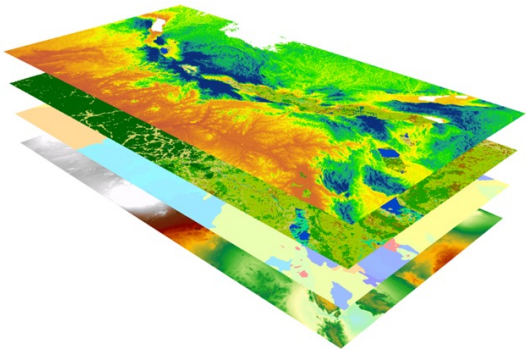
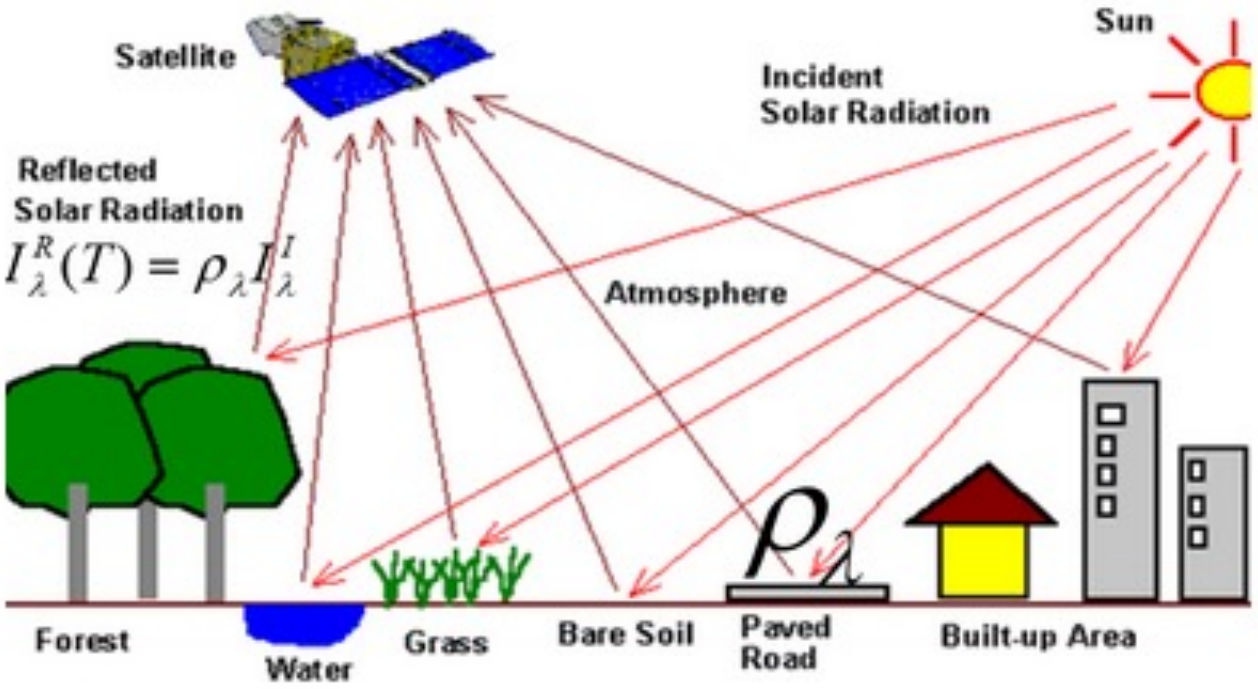


Figure 14. Elephant population trends in Uganda over the years (1960s–2014) (UWA Archive)

1: Brooks et al 1962- The Journal of Wildlife Management
2: UWA. Elephant conservation action plan for Uganda (2016 -2026

Remote sensing





http://www.eo4geo.eu/training/fundaments-of-optical-remote-sensing/

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Conservation of the endemic species of the Albertine Rift under future climate change

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[a] Wildlife Conservation Society, 2300 Southern Boulevard, Bronx, NY 10460, USA
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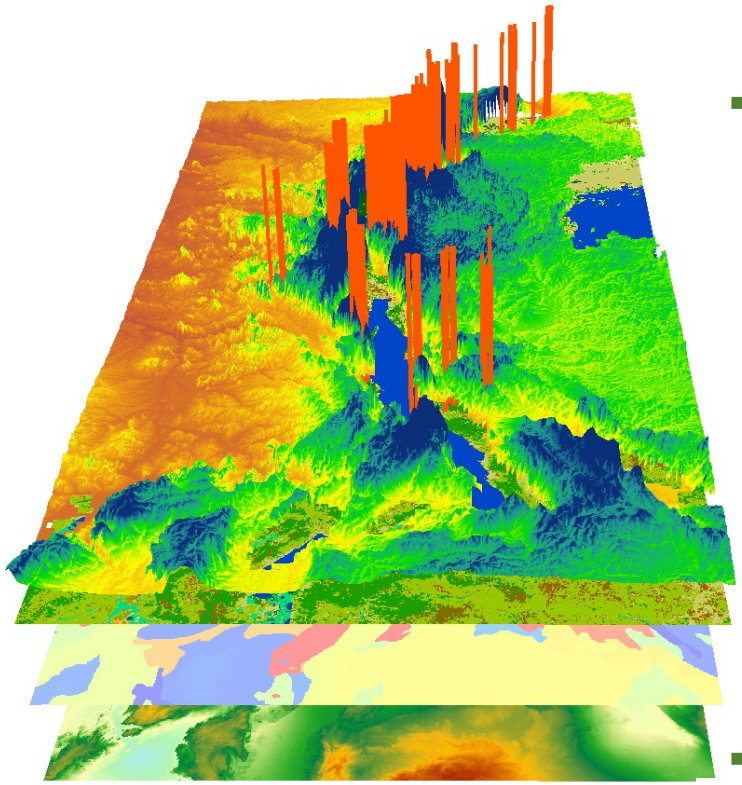
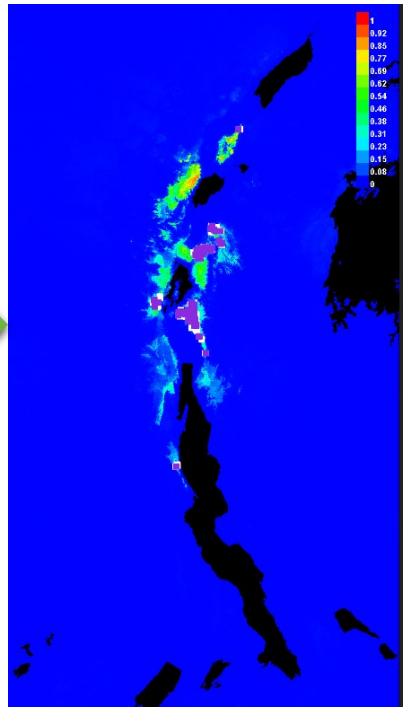
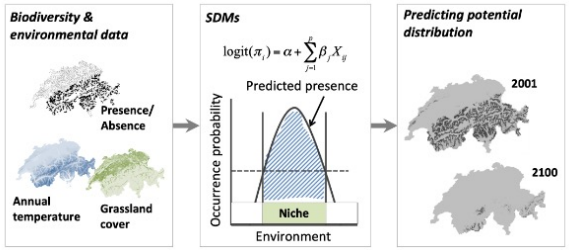


Predictions (Space& Time)

Fit a model





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CONTRIBUTED PAPER

Conservation of vertebrates and plants in Uganda: Identifying Key Biodiversity Areas and other sites of national importance

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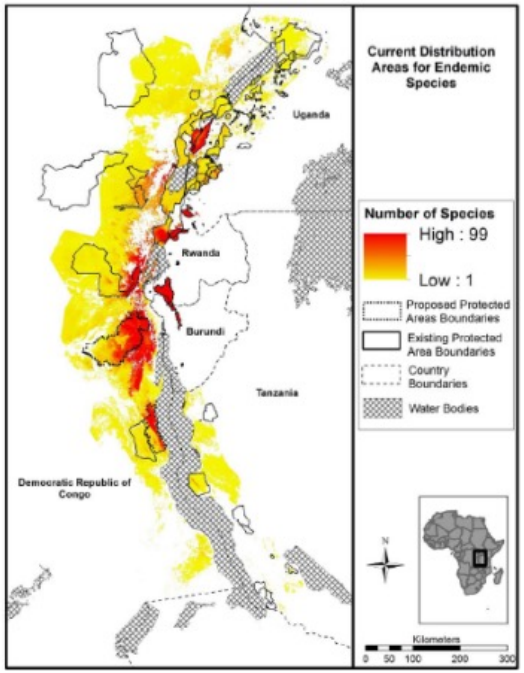
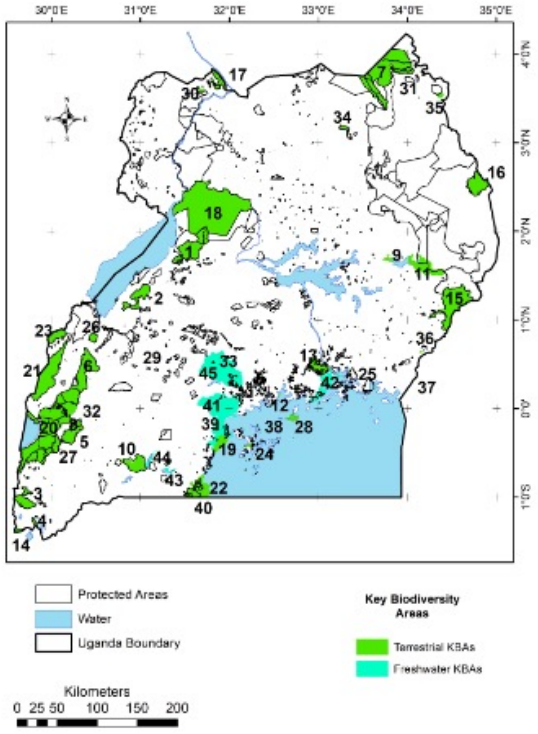




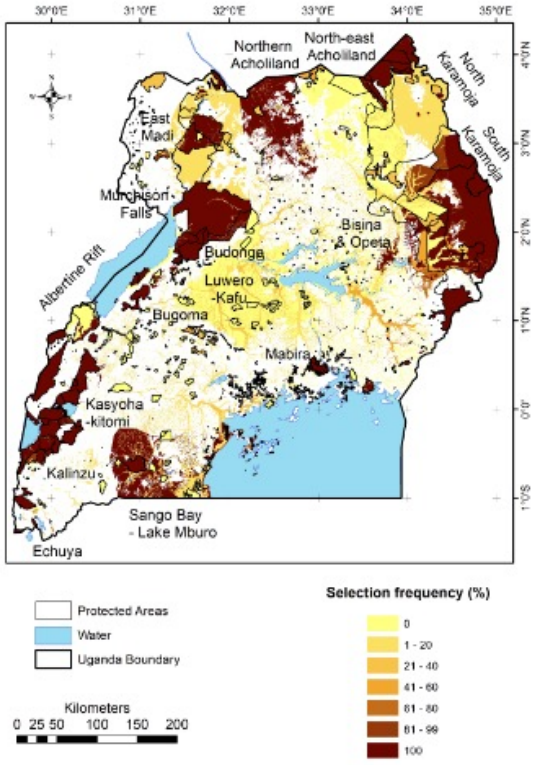
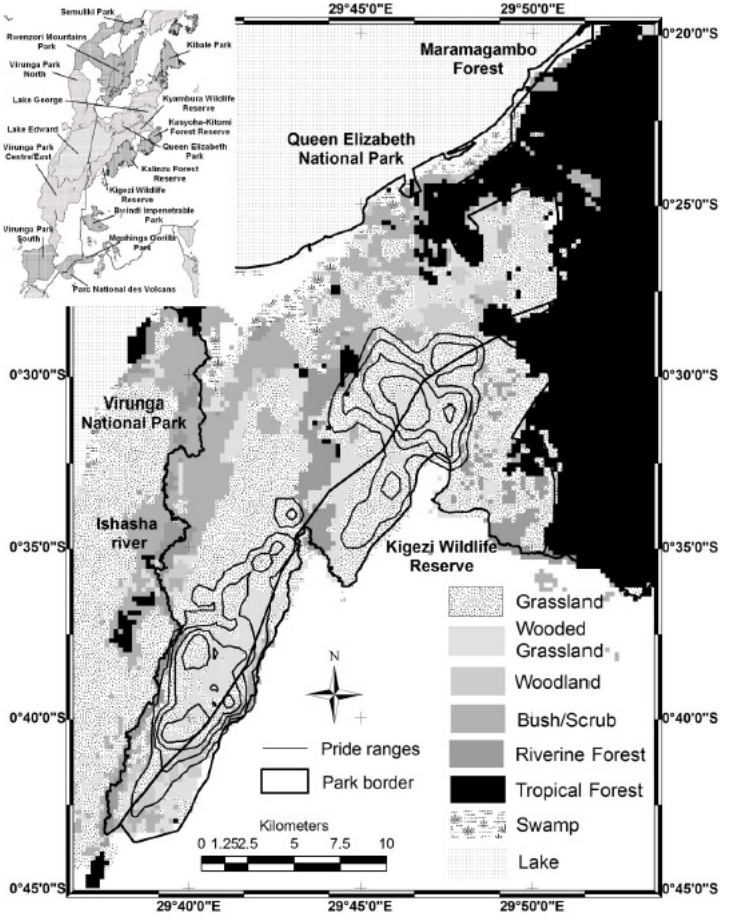


FIGURE 4 Proposed Key Biodiversity Areas (KBAs) identified in Uganda

Radio collars

- A small radio transmitter and battery fitted to animals

GPS/Iridium collars (TGW-4170-4, 4270-4, 4470-4, 4570-4, and 4670-4)

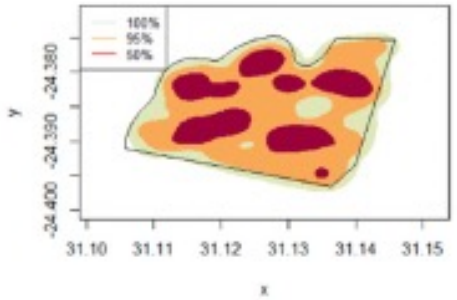


https://doi.org/10.2982/028.104.0115

Home Range and Movement Patterns

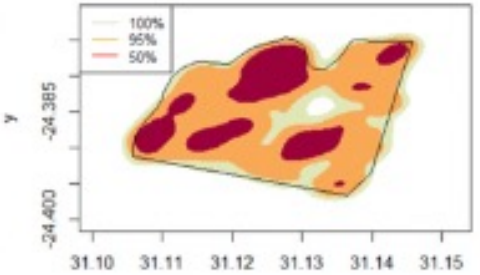
a. Royal Pride - 100% MCP

c. Royal Pride - KDE



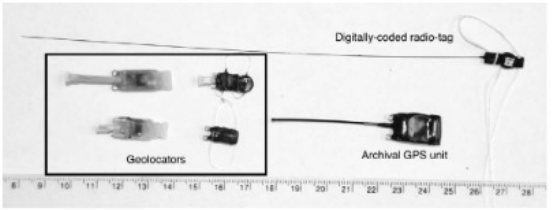
b. Tsau Pride - 100% MCP

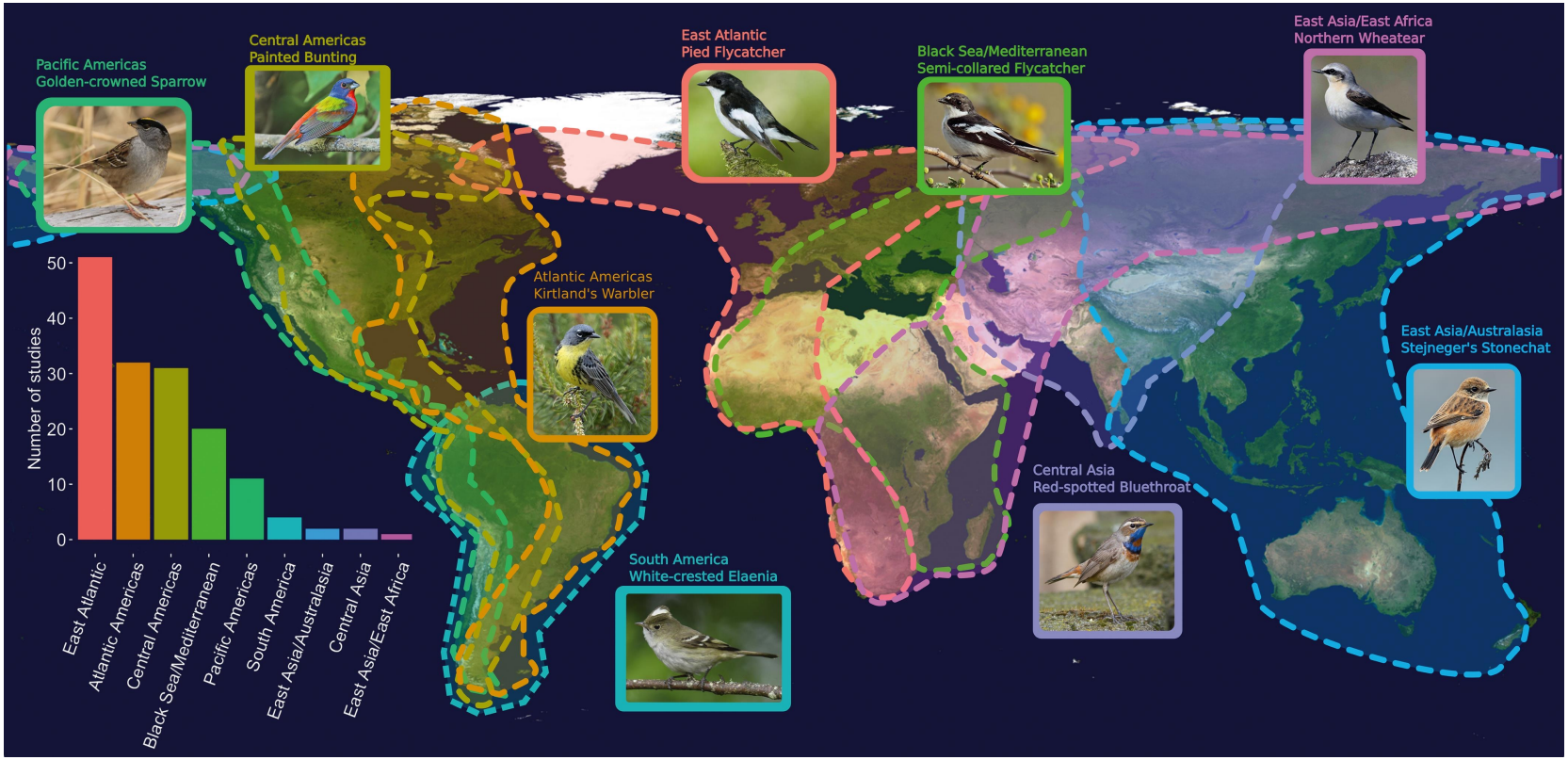
d. Tsau Pride - KDE



Turner et al. 2003. https://doi.org/10.3390/ani12152003

Migrations of small land birds

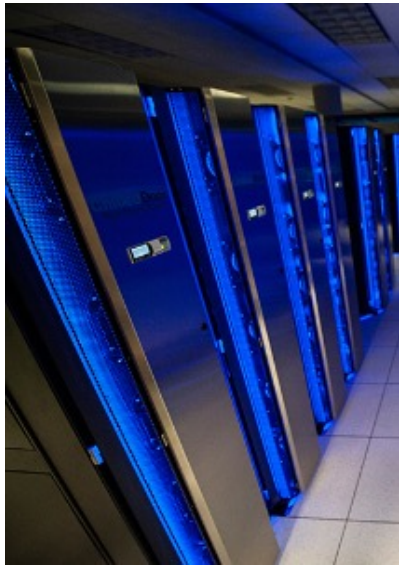




McKinnon, E. A., & Love, O. P. (2018). Ten years tracking the migrations of small landbirds: Lessons learned in the golden age of bio-logging. The Auk: Ornithological Advances, 135(4), 834-856.

Citizen science: Big Data

- High computing environment



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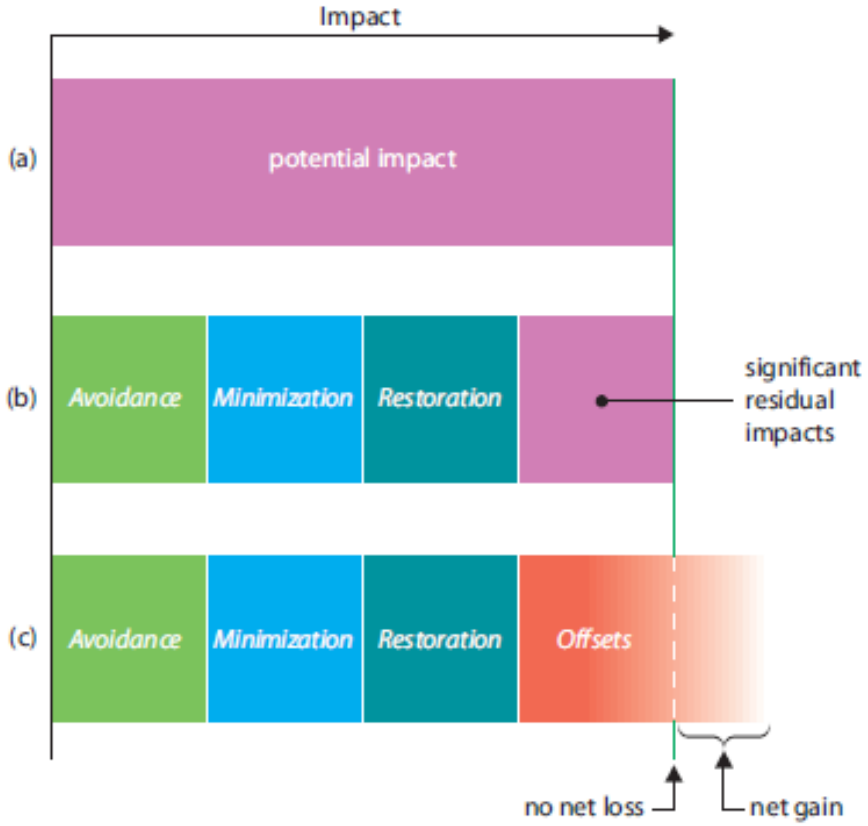
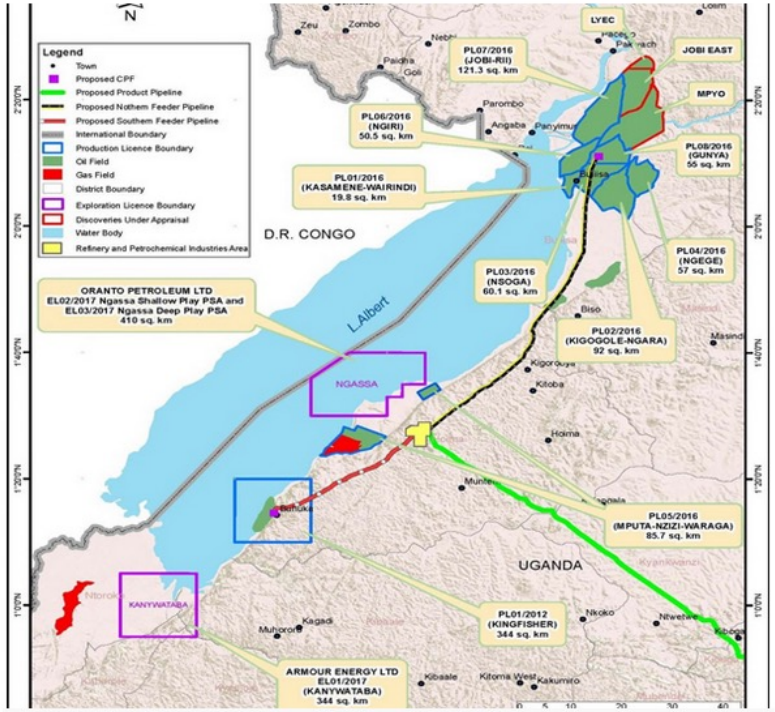
No net loss of biodiversity and ecosystem services

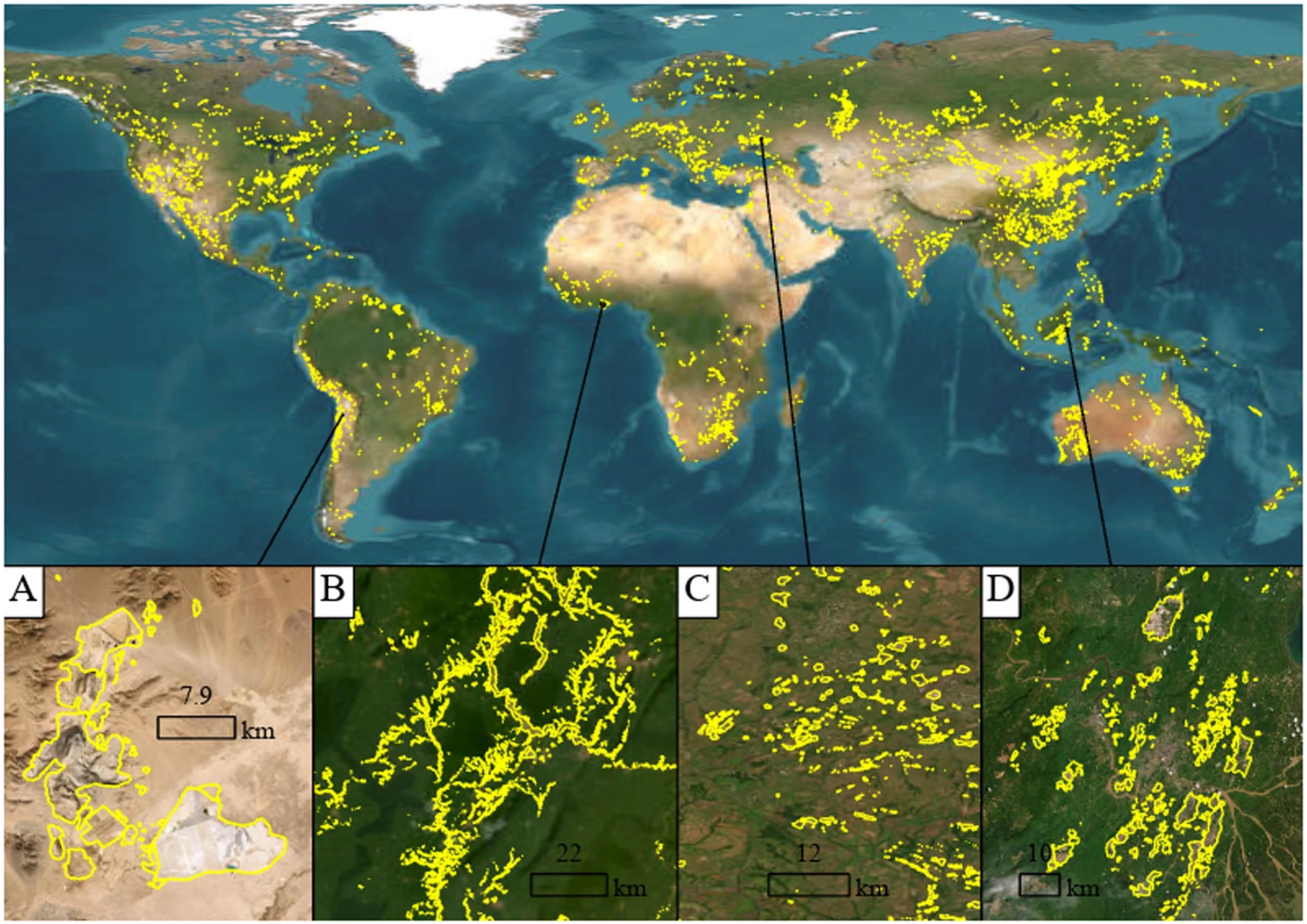




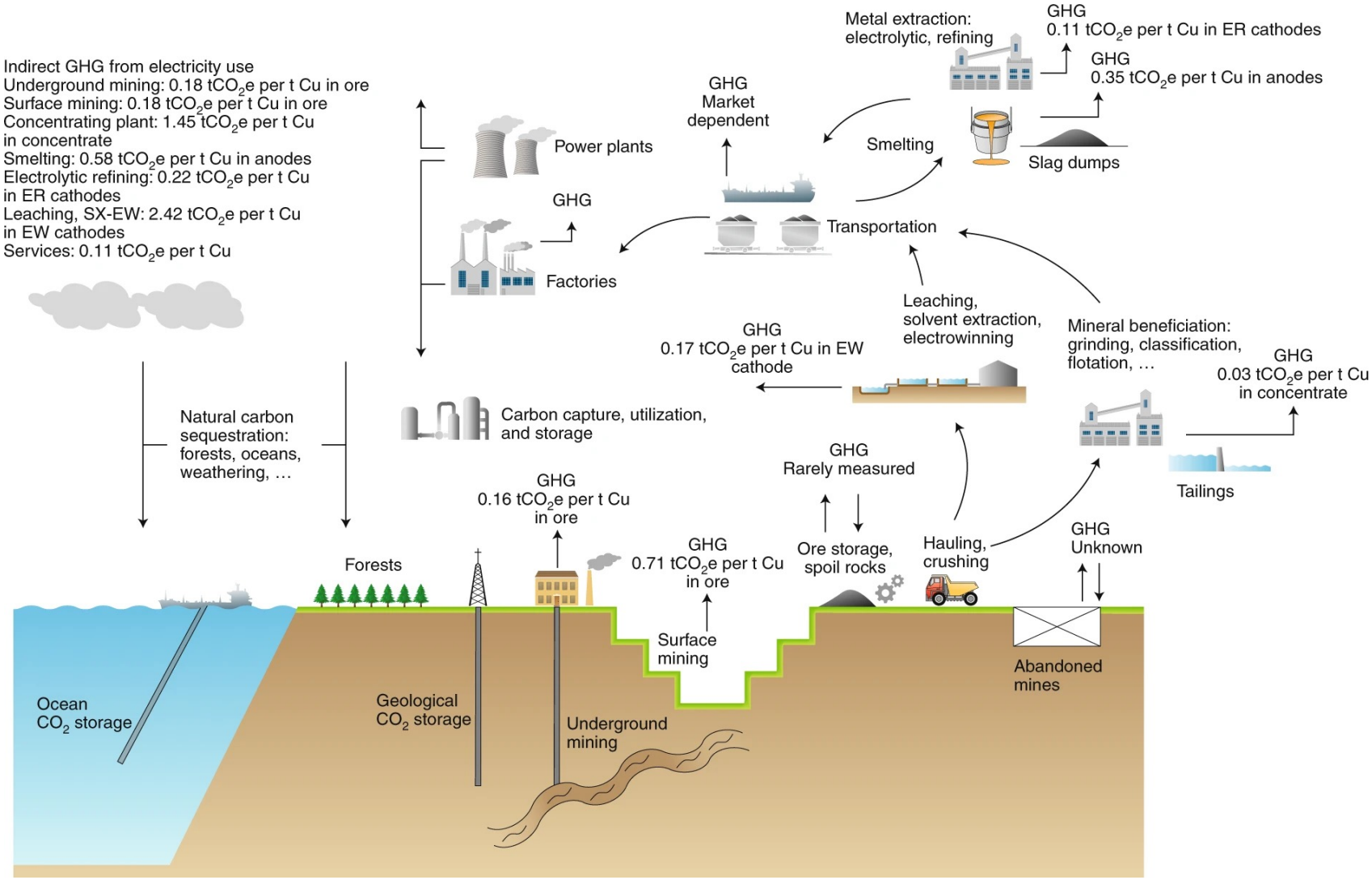
Petroleum Exploration in Uganda

https://www.unoc.co.ug/upstream/

Global mining footprint mapped from high-resolution satellite imagery



Greenhouse gas emissions from mining



https://doi.org/10.1038/s41561-020-0531-3

Thank you!