



Earth Science and *Applications* from Space

Remarks for the Next Decadal Survey

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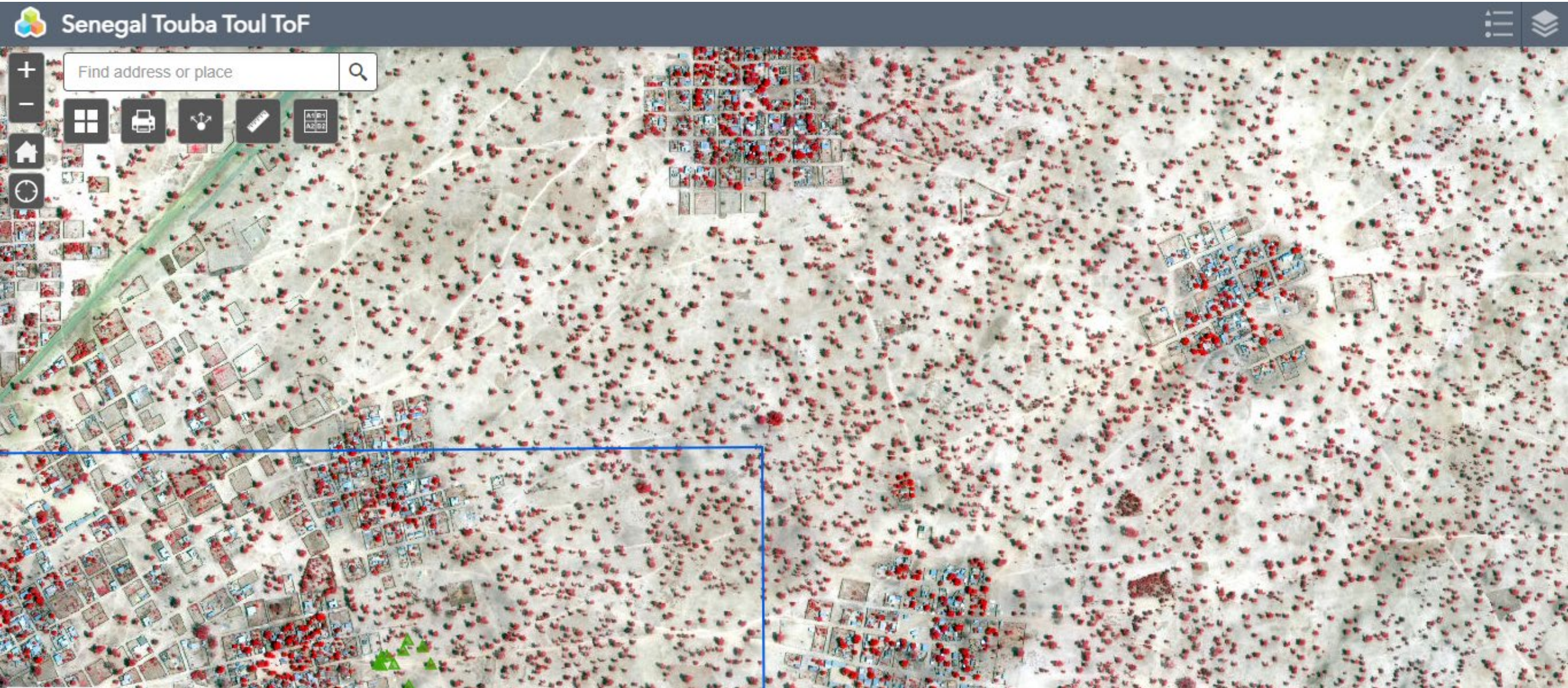
Main points

- Balance between Science and Application for societal benefits
 - Application should be science driven; better capabilities for prediction and attribution
- Balance between new Missions and sustaining Program of Record
 - The DS tends to emphasize new measurements, but a heavy consideration of maintaining continuity of the PR is needed
- Priority emphasis on continuity while advancing technical readiness

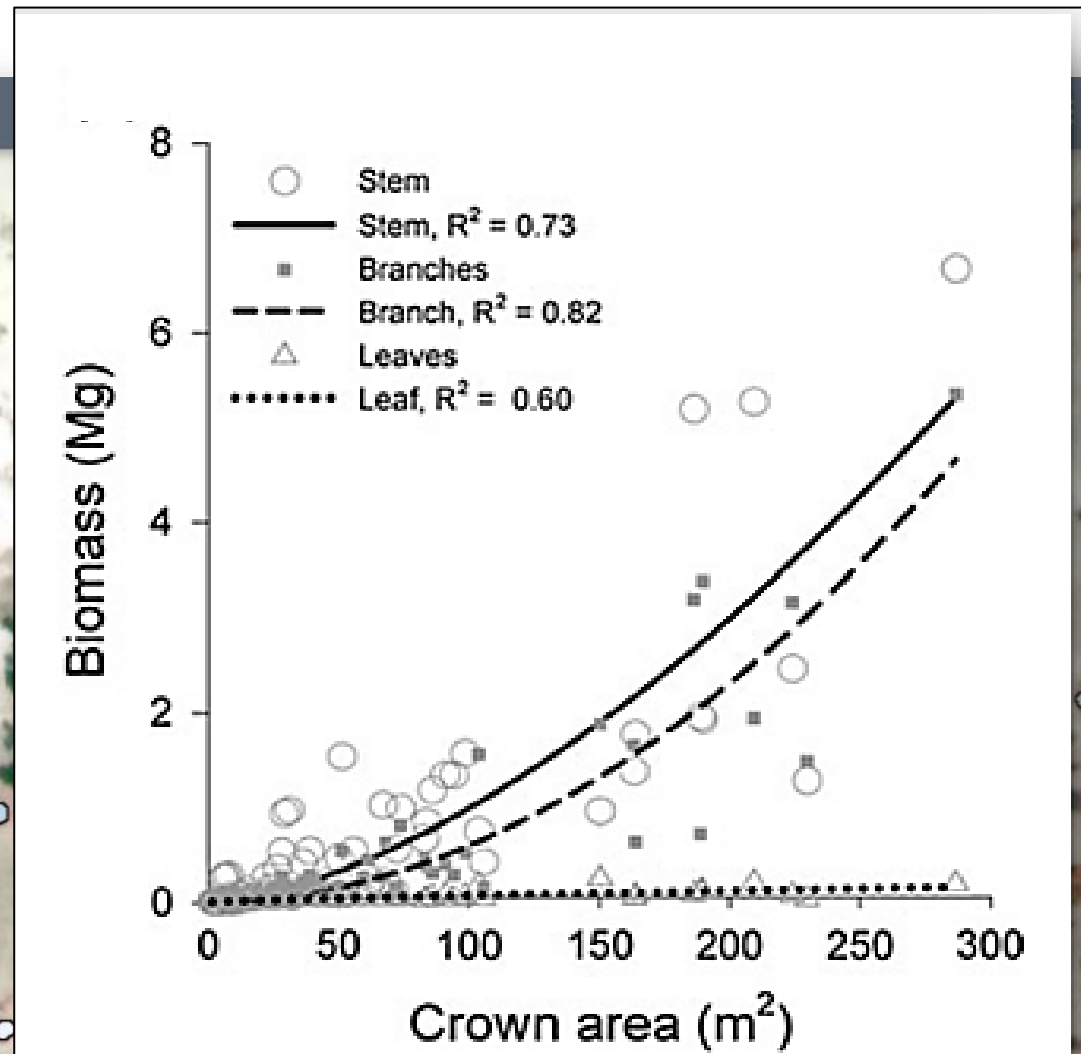
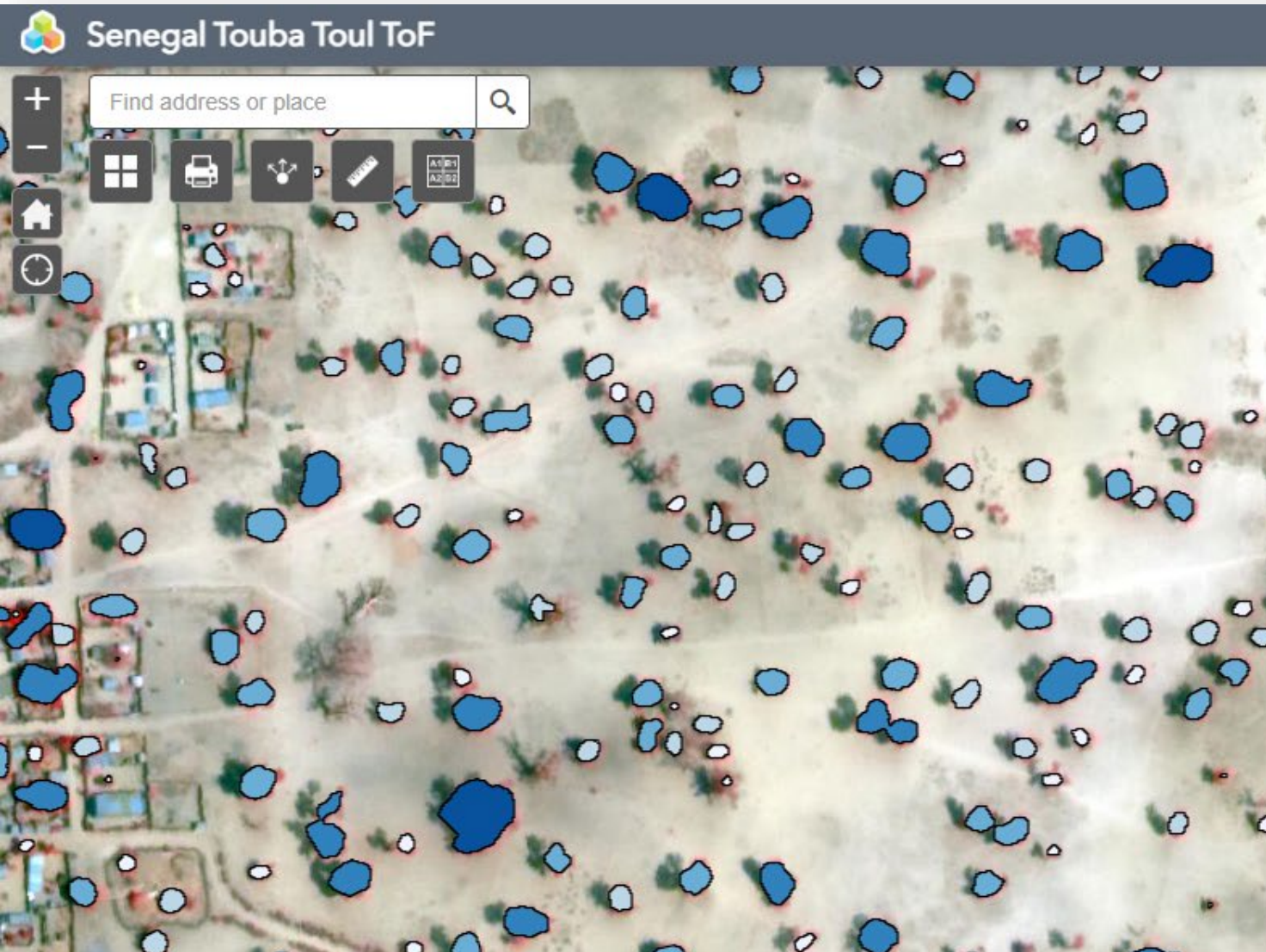
Main points continued

- Significant emerging role of the private sector
- Need to know when to use non-science-grade observations and when it is necessary to have science-grade observations
- Emerging importance on the data system, algorithms, and data buys
- Embracing the AI revolution, increasing scale and resolution – observations over continental scales at super resolution
 - Recognition that algorithms and processing are as valuable as observations

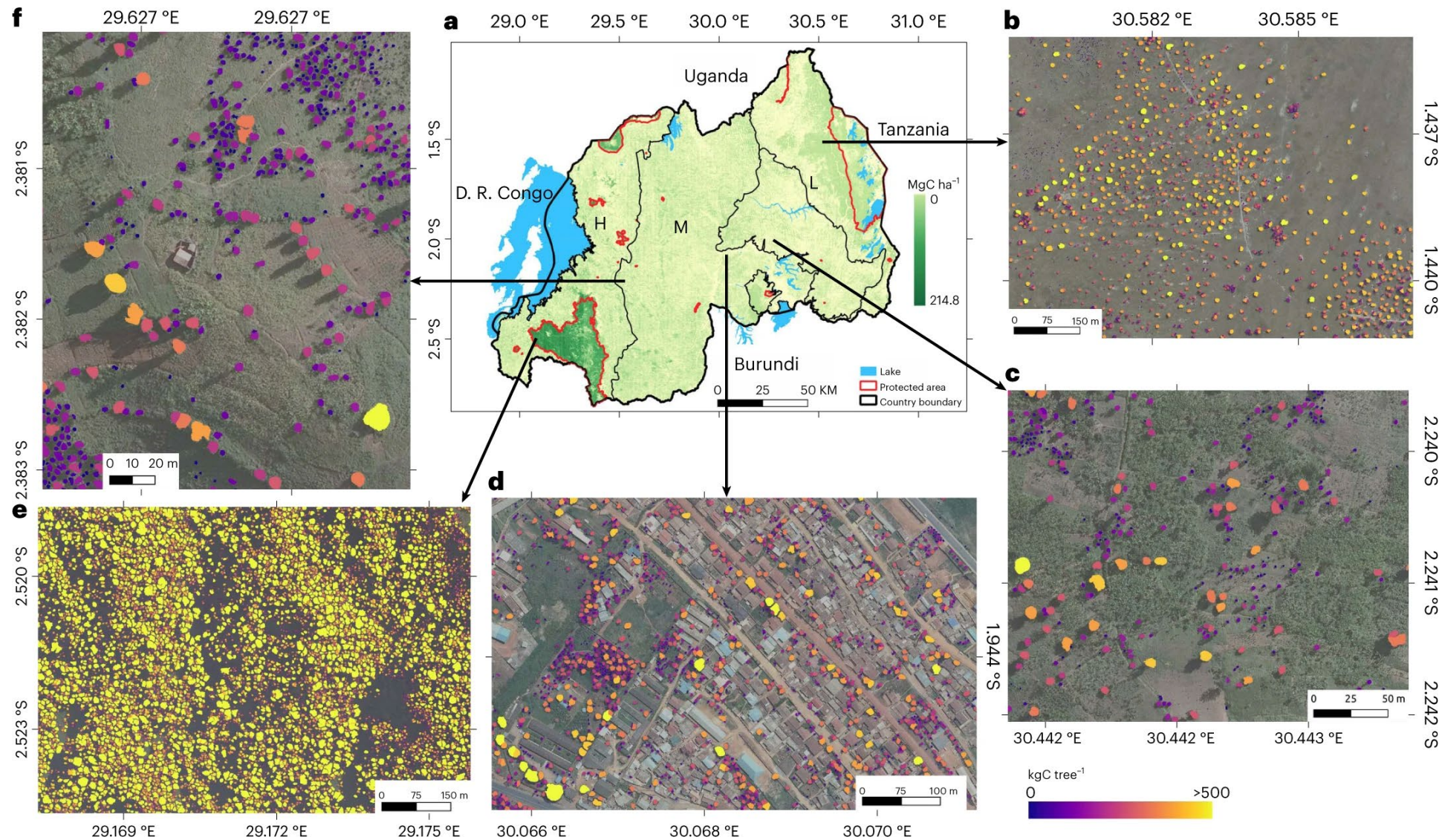
Proper Allometric Scaling of Carbon in Individual Trees



$$\text{AGB} = 2.568 * \text{CPA}^{1.418}$$



Individual Tree Carbon based on Allometry



An aerial photograph of a dense tropical forest. The canopy is a mix of various shades of green, indicating different tree species. In the upper right, a small clearing contains a simple building with a light-colored roof and a few palm trees. A white curved line is drawn across the image, starting from the bottom left and curving towards the top right, passing near the building. The text 'Acorn' is overlaid in the top left corner.

Acorn

Agroforestry Carbon Removal Units (CRUs)
for the Organic Restoration of Nature

Satellite images are used to check for deforestation and our model interprets satellite pixel pictures to annually measure biomass growth

End-to-end [4/6]

Farmer planted trees

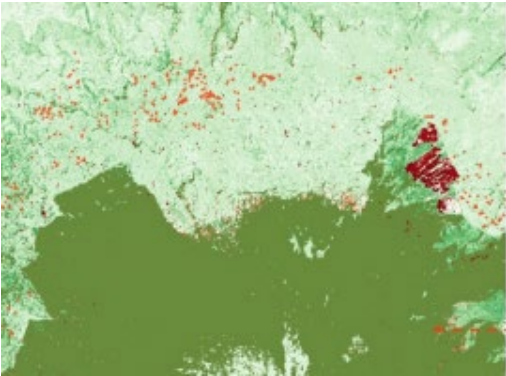
Farmer and polygon uploaded

Ground truth collected

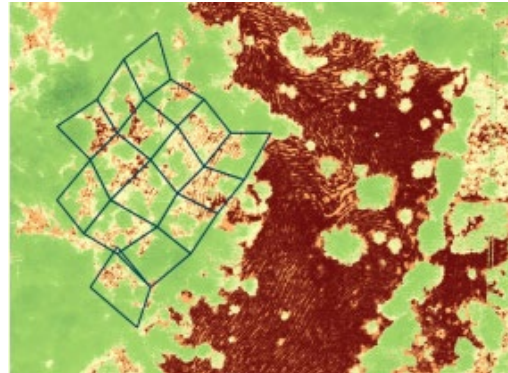
Biomass calculated

CRUs calculated

CRUs sold and registered



Checking for deforestation (t-5) check, with red being tree removal, red dots are plots



Training model based on ground truth data of the sample plot with satellite



BeZero

Unlocking NBS finance with new data, measurements, and technology

March 2024

Ronan Carr

Lead Analytical Officer

BeZero Carbon



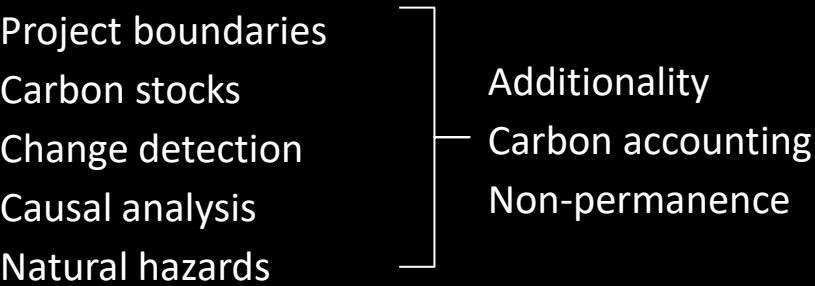
Ratings powered by in-house proprietary geospatial capabilities



>30

experts in remote sensing, forest ecology, peatlands and blue carbon, ecosystem disturbance, statistics, machine learning and artificial intelligence.

Best in class, near real time data and analysis for nature based projects



A Look Around the Corner

- Society's need for environmental measurement and monitoring has been changing.
- With that, how the EO science community interacts with stakeholders is changing.
- Old way: EO supports basic policy needs of governments and “policy makers who need EO to make decisions”
- New way: key engagement with new communities and institutions who need EO to contend with demands for sustainability and climate change:
 - Climate finance and financial institutions
 - Banks that make Nature-based Investments
 - Climate risk assessment by firms and investors
 - Supply chains assurance and insetting management operations (EUDR)
- *Trying to look for applications relevance from science missions has been challenging. Yet growing number of applications directly need science measurements*

Since the last DS the EO sector has rapidly evolved into an extensive ecosystem of diverse highly technical and science-based value chains involving public and private actors.

