2021 NASA Biodiversity and Ecological Forecasting Virtual Team Meeting

Biodiversity and Remote Sensing:

Understanding and Saving Life on Earth

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Roots

Progress in Physical Geography 32(5) (2008) pp. 575–580

Classics in physical geography revisited

Skole, D.L. and Tucker, C.J. 1993: Tropical deforestation and habitat fragmentation in the Amazon: satellite data from 1978 to 1988. *Science* 260, 1905–1910.

Systematic and large-scale deforestation of the Brazilian Amazon basin began in the mid-1960s, and recent assessments show that approximately 650 × 10^3 km^2 of Brazilian forests were cleared in the following four decades (Fearnside, 2005). Deriving estimates of deforested area and clearing rates at this regional scale is feasible only through analysis of satellite imagery, data which first became available for public use with the introduction of the Landsat series in 1972. Since that milestone date, use of satellite data has enabled increasingly sophisticated understandings of ecosystems and biophysical processes, with improvements in measurement accuracy aided by newer sensors having greater spatial resolution.

Figure 1 David Skole

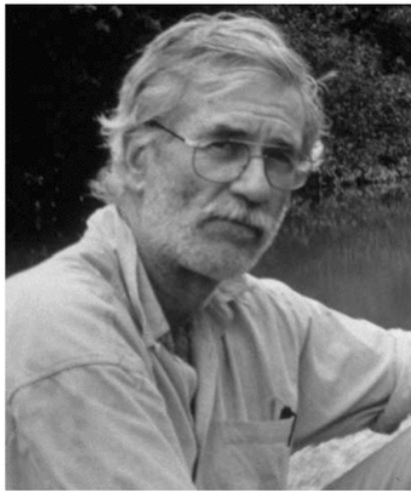


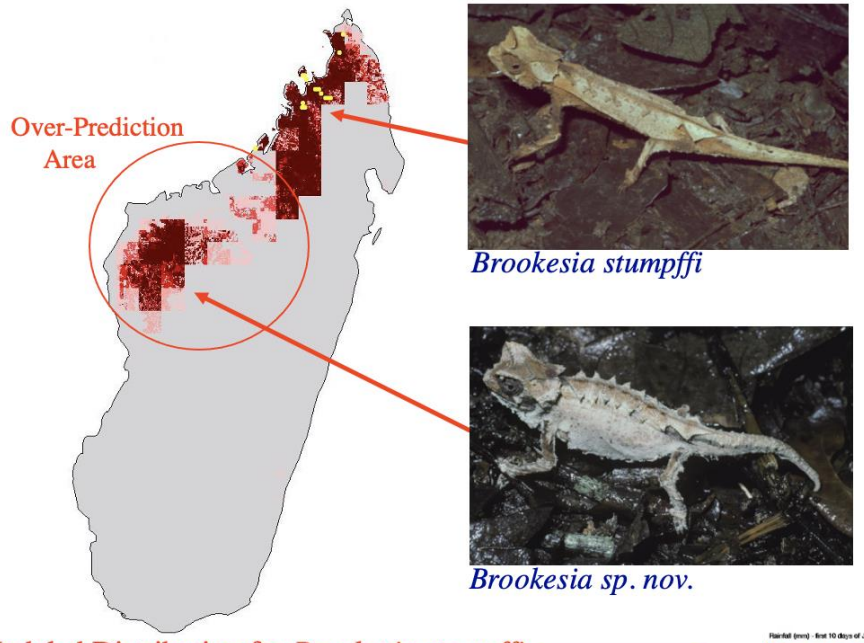
Figure 2 Compton J. Tucker

DOI: 10.1177/0309133308096755

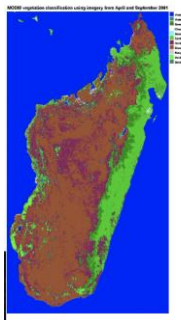
Predicting distributions of known and unknown reptile species in Madagascar

Christopher J. Raxworthy, Enrique Martinez-Meyer, Ned Horning, Ronald A. Nussbaum, Gregory E. Schneider, Miguel A. Ortega-Huerta & A. Townsend Peterson

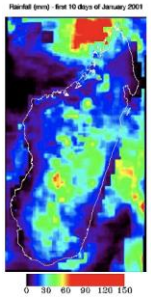
Nature **426**, 837–841 (2003) | Cite this article



Modeled Distribution for *Brookesia stumpffi*



MODIS Land Cover at 1km

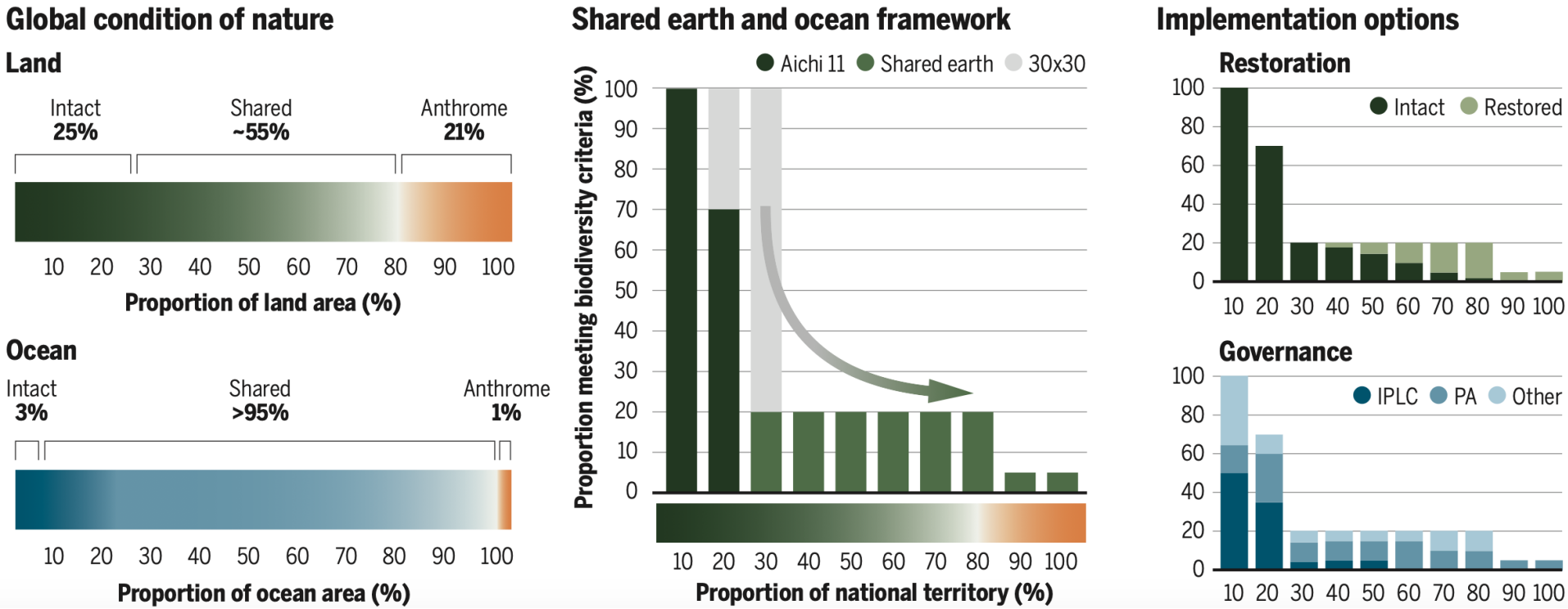


NOAA Precipitation at 5 minutes resolution

EcoRegions and Greenness to 30X30

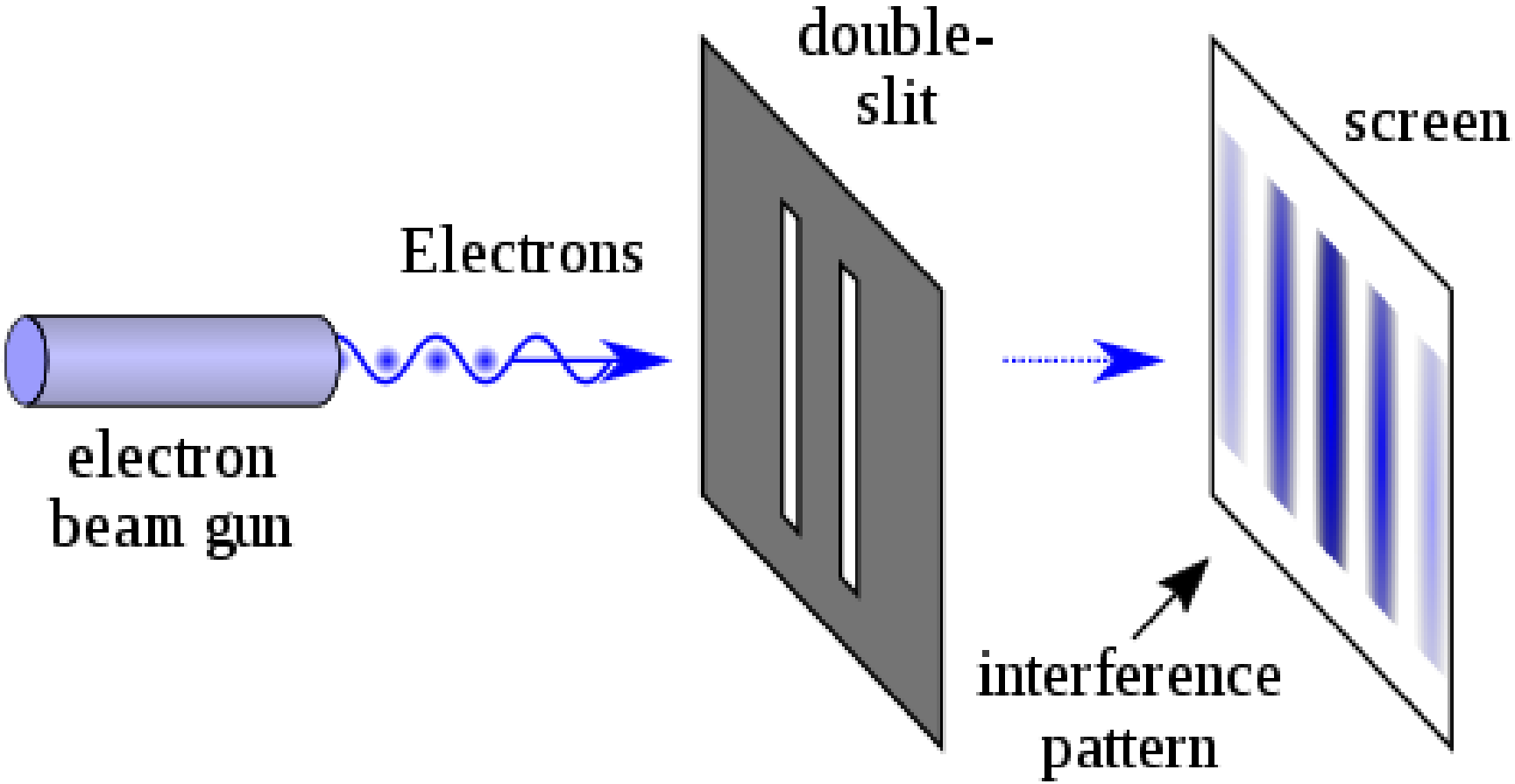
Shared Earth, shared ocean framework

(Left) The approximate proportion of land or ocean area in 2020 in which nature is intact, variably affected in shared spaces, or fully altered in anthromes [from (*2*)]. (Middle) Schematic allocation of effective conservation actions on land across the gradient of condition (as in left panel) in a country or territory. Protection of 17% of total land under Aichi Target 11 is depicted in the 0 to 20% of land where nature is most intact. Protecting 20% of area under intact native habitat is shown in shared spaces, from 21 to 80% of territory. Protecting 5% of area under intact habitat in anthromes is shown from 81 to 100% of territory. The sum of these meets the draft global biodiversity framework target of 30% protected. Relative to the 30x30 campaign for protecting nature in areas most important for biodiversity, the shared Earth approach spreads effort and benefits of additional conservation across space. (Right) The contribution of restored versus intact habitat will increase in more altered shared spaces and in anthromes. The contribution of different governance regimes, such as by Indigenous people and local communities (IPLCs), conventional protected areas (PAs), and "other" mechanisms, may vary across spaces. Axes labels are as in the middle panel.



David Obura et al. *Science* 373:746-748 (2021)

Growing Remote Sensing Biologists?



Remember Your First Box of Crayons?

However, in most cases, if one knows the spectrum, there is no need to take integrated measurements, since one can easily integrate the data later. Indeed, although they can't convert radiance to irradiance, spectra are a central clearinghouse that can be converted into almost every other light measurement. In fact, the benefits of spectral measurements so far outweigh the costs that the best purchase for anyone measuring light is a spectroradiometer.

<u>The Optics of Life</u> Sonke Johnsen

The Fighting Temeraire *Source: Wikipedia*

Thank You