

Past, present and future social-ecological- environmental system interactions in East Africa: changing environments = changing values

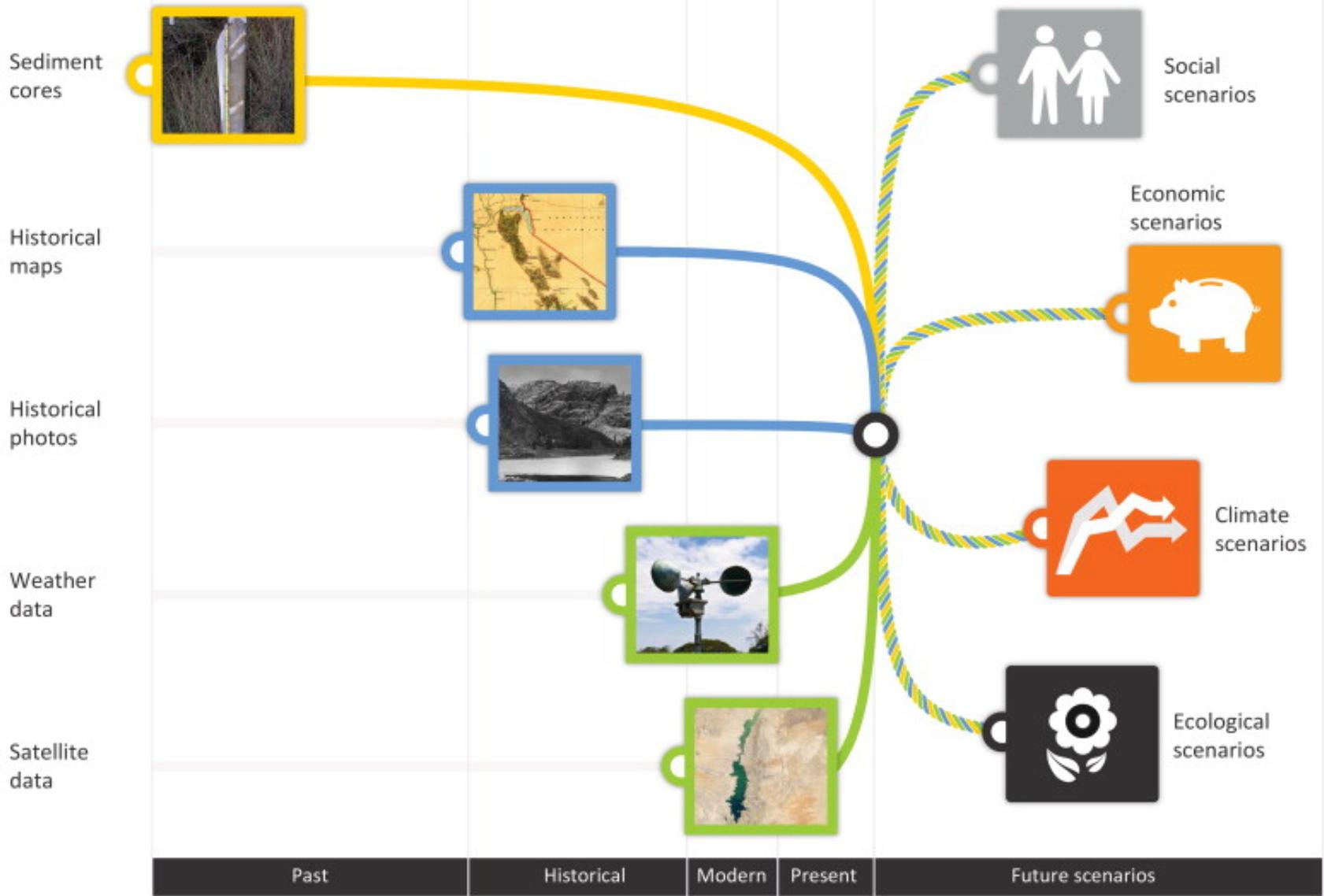
Rob Marchant

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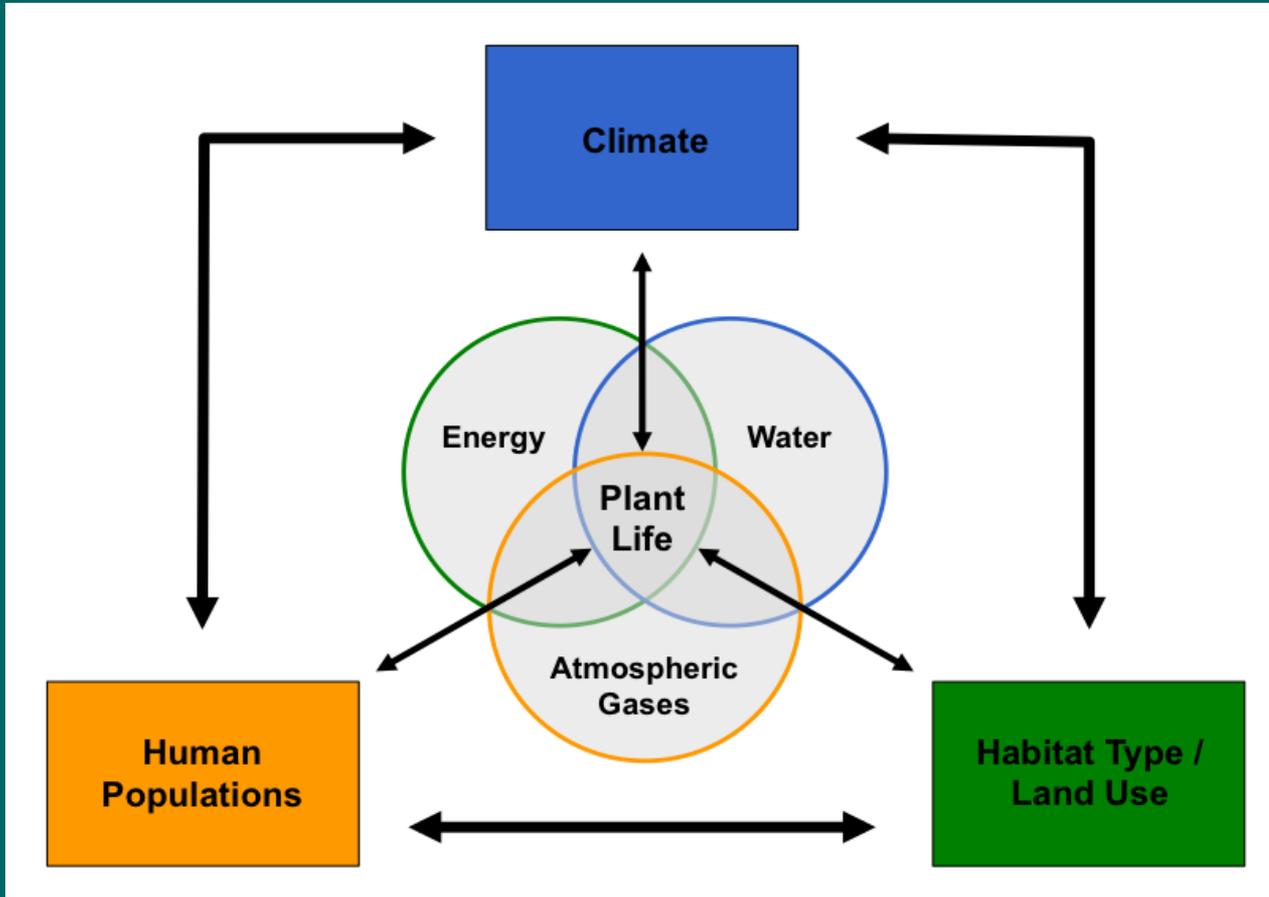


@marchant_robert

<http://www.york.ac.uk/res/kite/>



A Landscape approach to understanding ecosystem change at multiple temporal and spatial scales is crucial



“Natural capital is driven by the interaction between sunlight and plants”
Dr. Julius Kipn’getich, Director KWS Nairobi Sept 2010

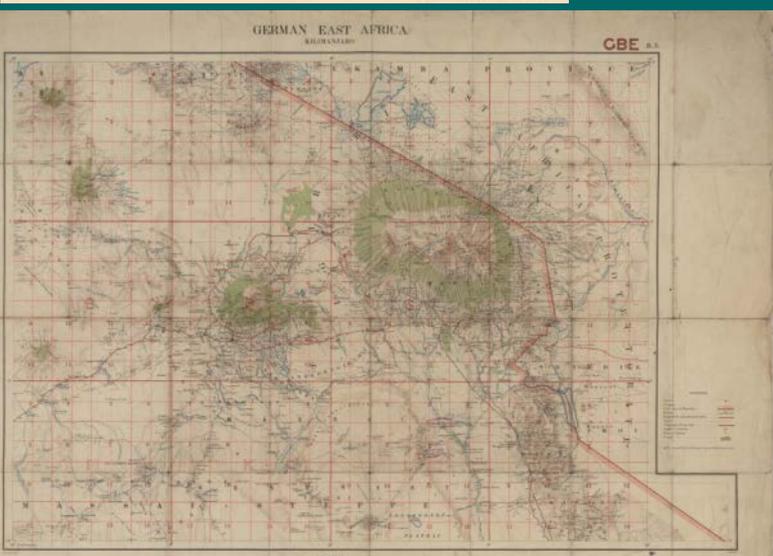
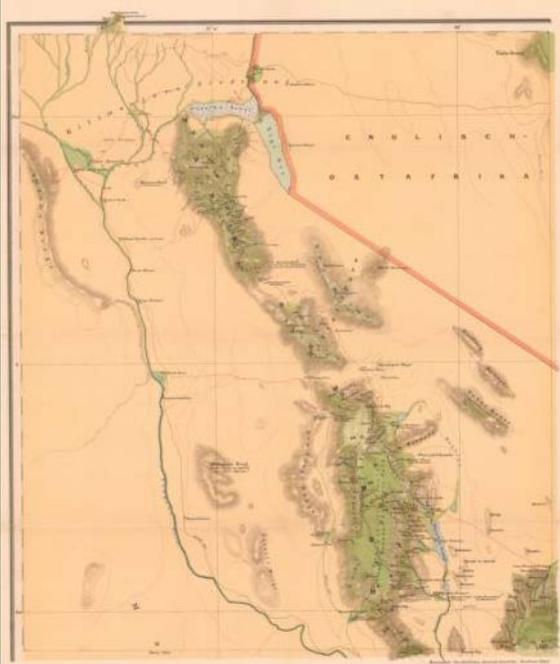
Animals make a difference



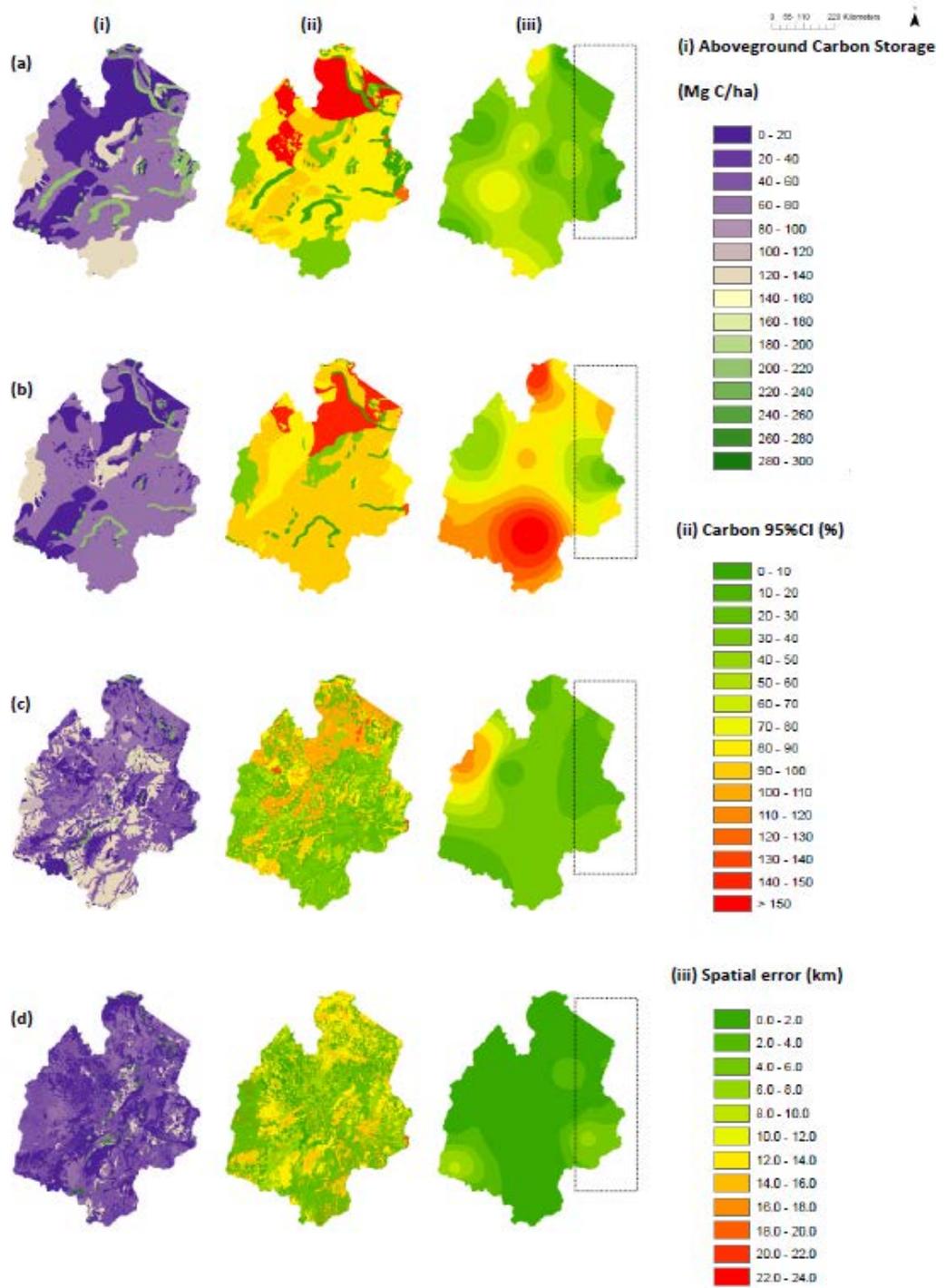
?
 CO_2



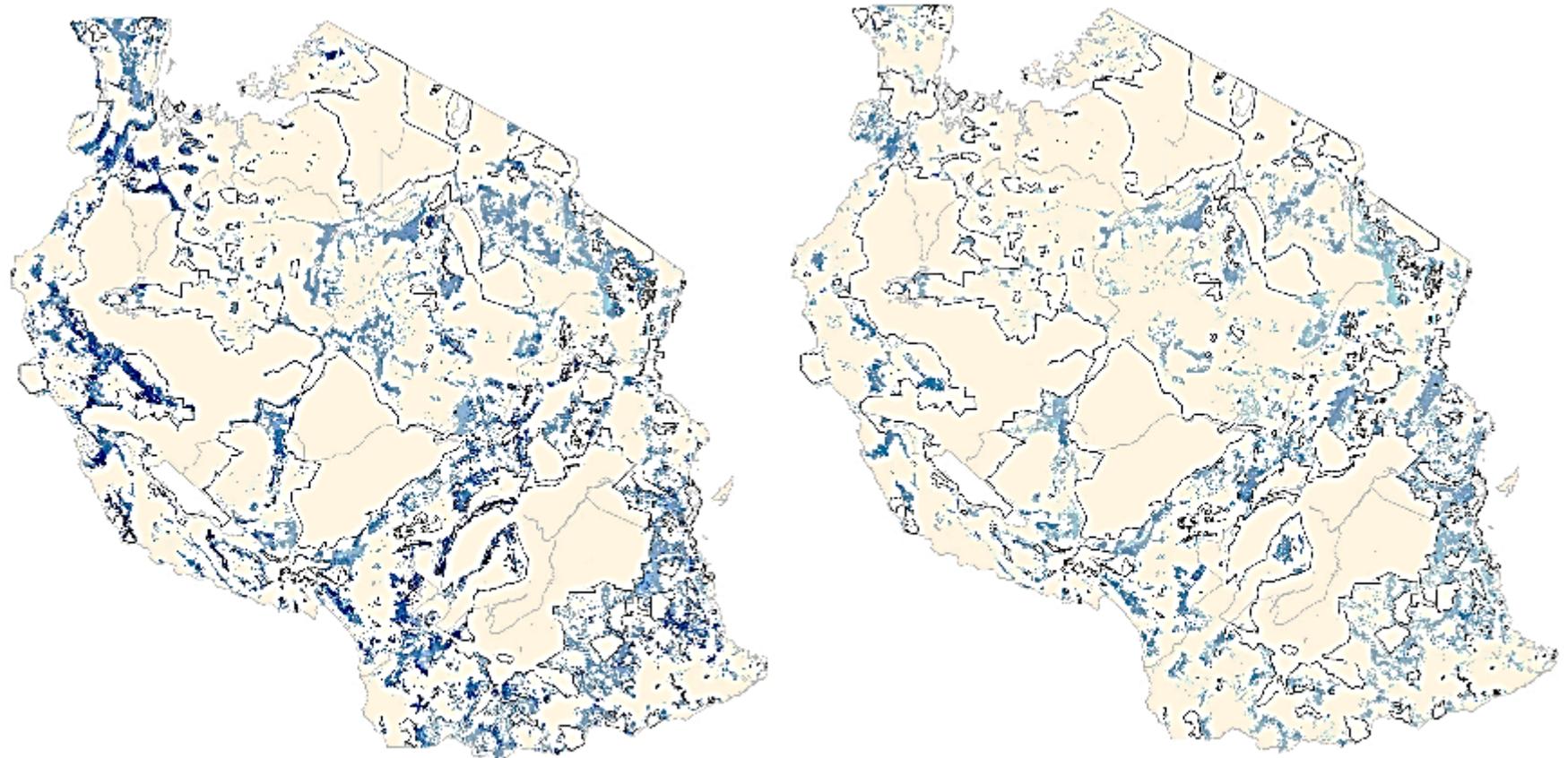
Significant implications for ecosystem management



100 years of carbon change:
 Issues surrounding climate variability and
 management (REDD+) can be set in
 historical context
 (Willcox et al 2016 Global Change Biology)



Carbon stock change : REDD+ post Paris COP



Total C stock change

High : 1082.85

Low : 0

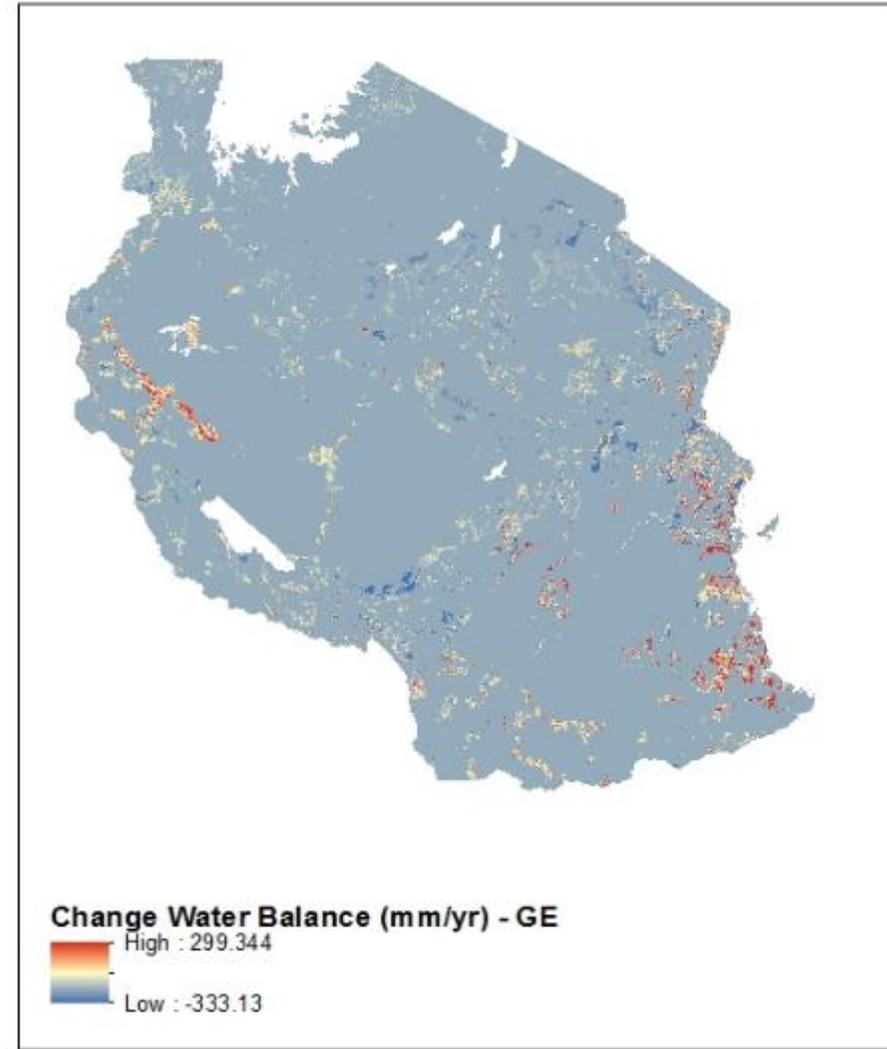
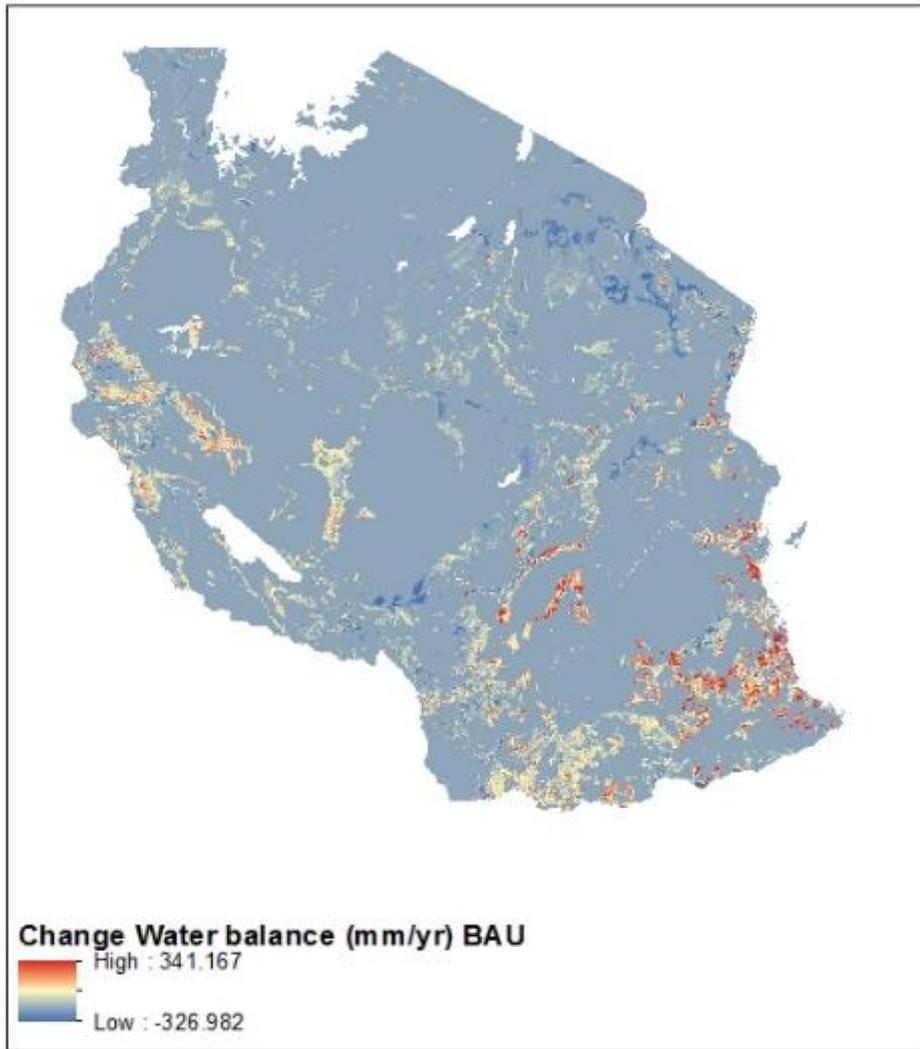
WDPA_Terrestrial

BAU: 295,673,267 Mg C stock loss

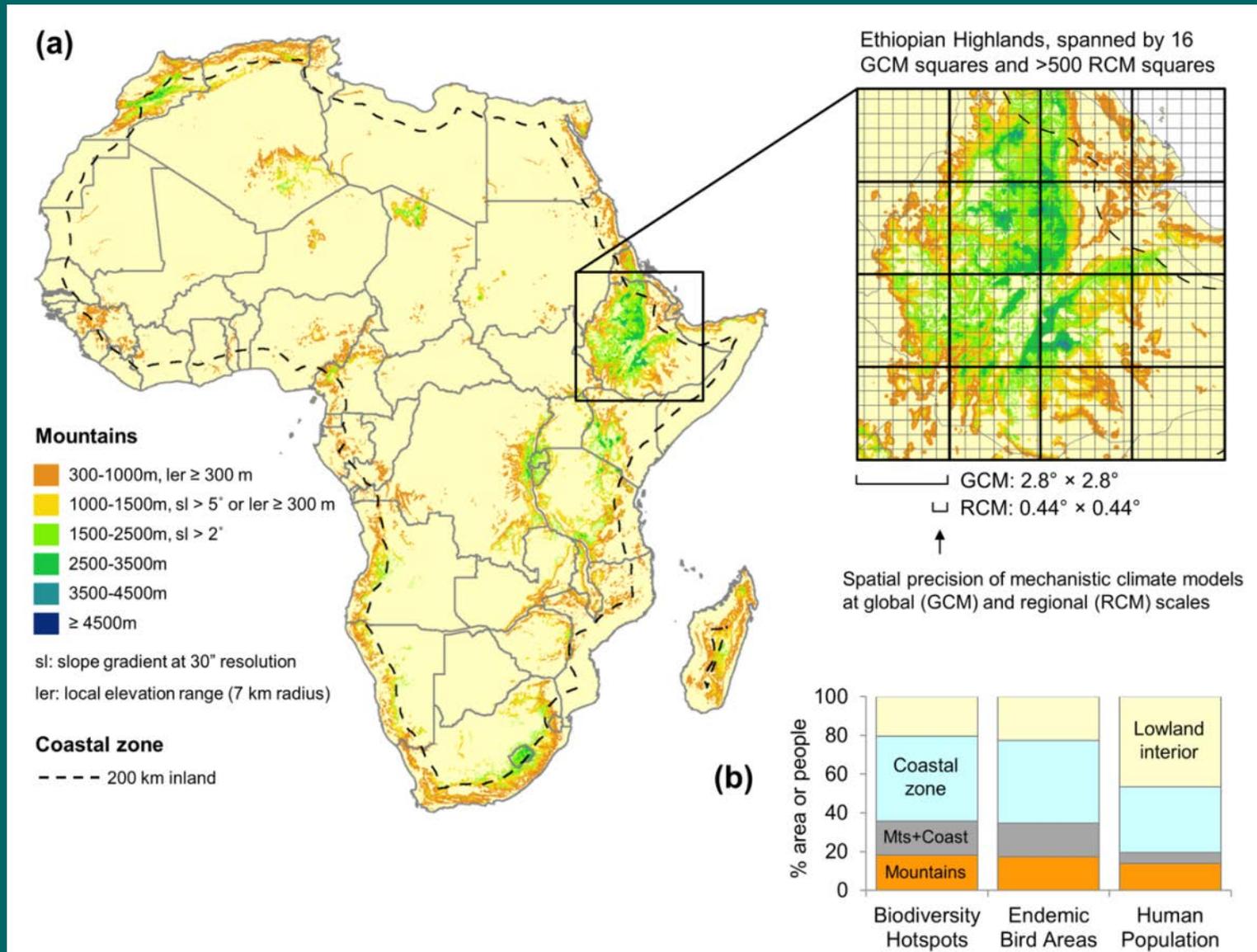
GE: 137,014,851 Mg C stock loss

Capitani et al. in prep

Water balance change



Spatial downscaling of global climate scenarios



Change in annual temperature (°C)

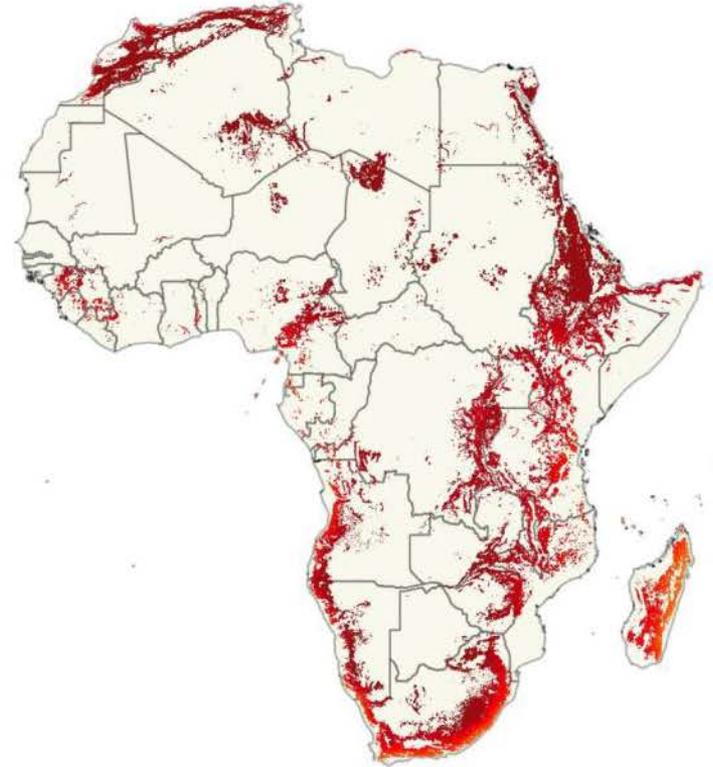
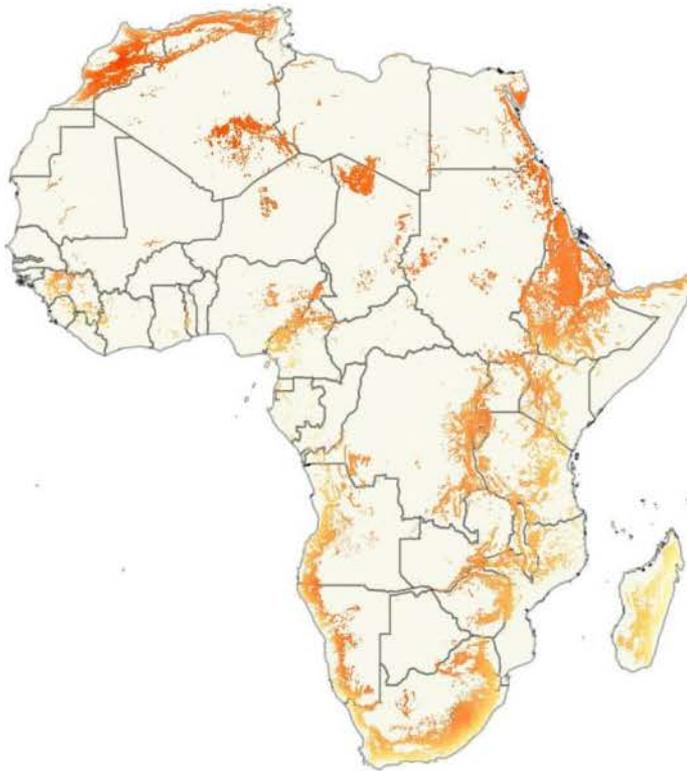
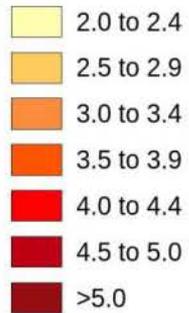


Figure 2. Change in annual temperature across the African mountains between a) baseline and mid- 21st century and b) baseline and late 21st century.

Change in annual rainfall (mm)

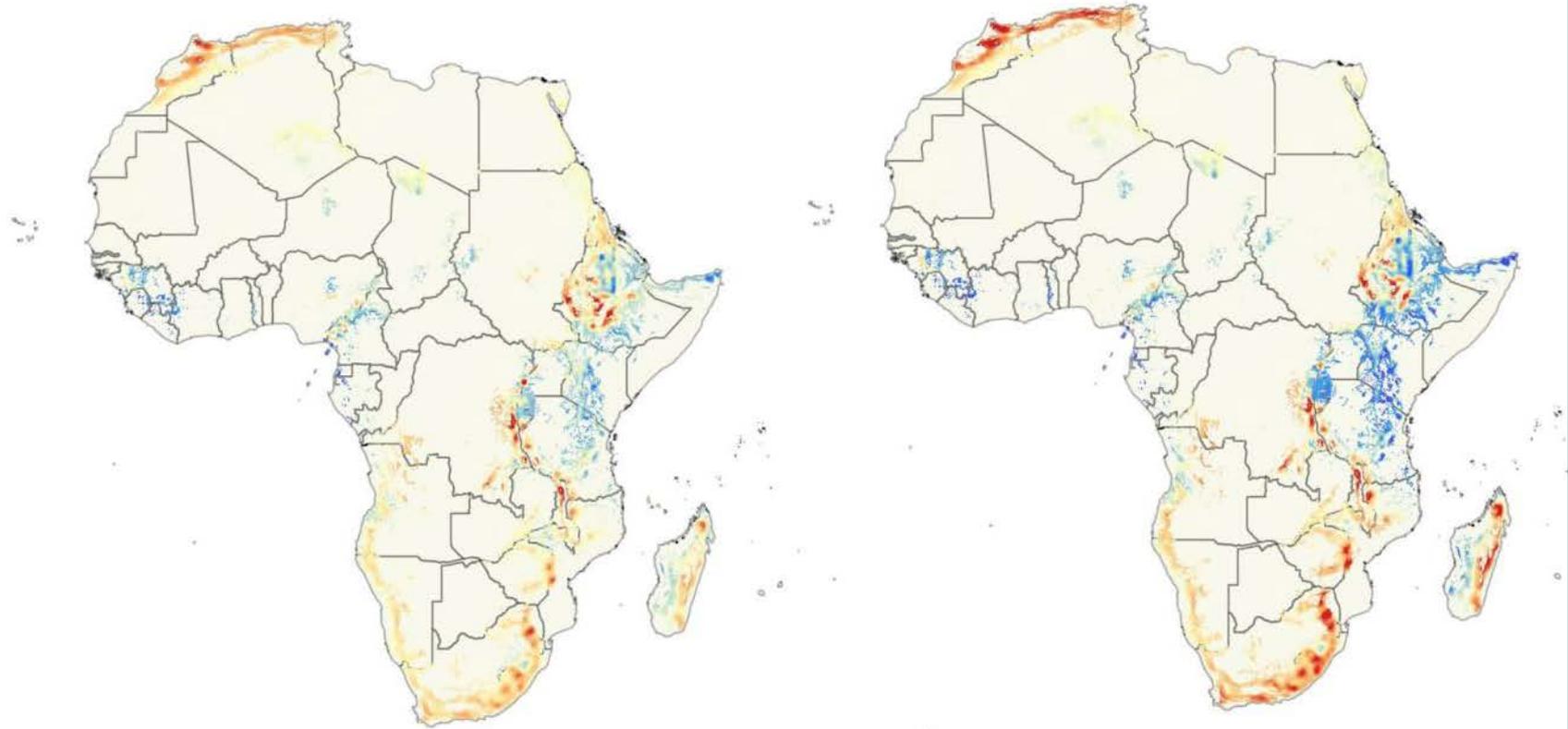
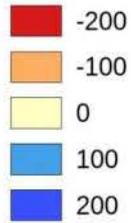
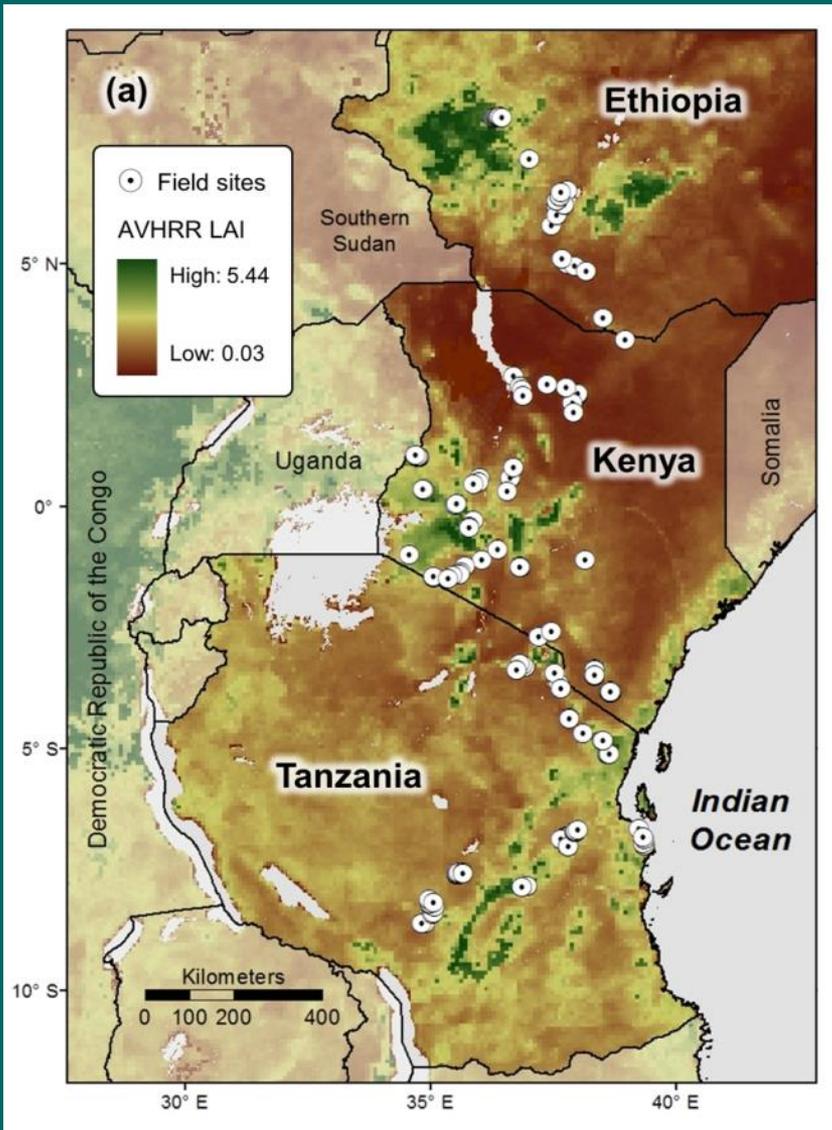


Figure 4. Change in annual rainfall across the African mountains between a) baseline and mid- 21st century and b) baseline and late 21st century.

Beneath the canopy



Future developments

- ◆ Map understanding of spatio-temporal rate and direction of change.
- ◆ Integrate information to characterise ecosystem dynamics at fine grain size – to capture climate and ecosystem trends under different states.
- ◆ Apply the developing scenario approach to *integrate* environmental, ecological and social interactions such hydrology, biodiversity, carbon, people and livelihoods.
- ◆ Change in non-climatic factors – particularly land use, demographics, crops choice, social change
- ◆ Training and dissemination

