**One-page outline plan**

**Title**

Mapping the influence of accessibility to cities on the compositional similarity of terrestrial animals globally

**Background/rationale**

Human alterations to the biosphere are seeing unprecedented extents. Urban centres play a major role in both the alteration of the environment but also as a place of access to opportunities and wellbeing aspects such as education, health services and financial institutions. Advancing accessibility globally predicate the equity agenda of the UN and the pursuit of the Sustainable Development Goals. On the other side, accessibility often comes with habitat change, which is one of the biggest impairments on biodiversity. The present global decline in biodiversity can lead to degradation of ecosystem functions. Assessing the impact of human development, as here in the form of accessibility to cities, on biodiversity metrics is essential for efficient allocation of conservation resources.

**Main questions to be addressed**

1. Does accessibility to cities lead to biodiversity homogenization?
2. Does accessibility\*population density lead to biodiversity homogenization?
3. At what travel time distance to cities (=accessibility) is biodiversity the most/least homogenous?

**Hypotheses**

1. H1: Communities are more heterogenous at very low and high score of accessibility

H2: Communities are more heterogenous at very low score of accessibility

H3: Communities are more heterogenous at very high score of accessibility

H4: Communities are more heterogenous at immediate score of accessibility

1. H1: Communities are more heterogenous at low population density (for both accessibility high and low)
2. H1: Communities are more heterogenous between 1-5h of travel time away from cities

**Methods**

I aggregate data for change of terrestrial compositional biodiversity from the BioTime biodiversity dataset, map global trends from 2005-2015 and match the scale to that of the accessibility map. From the accessibility data set I can obtain an accessibility score. Then, I can do a hierarchical linear model how accessibility is affecting the homogeneity of communities globally. I can also include the interaction term population density.

**Expectations of findings**I expect to find vast regional differences in how accessibility affects biodiversity.