**1. Introduction**

Nowadays, global warming is unimaginable. In response, changes in climate have caused impacts on natural and human systems on all continents and across the oceans, which means that global species’ distributions, populations, and other activities are highly affected by climate changing (ARS Synthesis Report, n.d.). Therefore, studying environment-containers to identify priority protected areas is of significance to species protection.

**2. Data used**

- **Climate data**: ERA5 monthly minimum air temperature at 2m height, maximum air temperature at 2m height and total precipitation data with 0.25 degrees resolution from 1979 to 2019 (Copernicus Climate Change Service (C3S(2017))).
- **The species distributions data**: Birds dataset from IUCN Red List of Threatened Species™ (IUCN 2020).

**3. Methods**

**Bioclimate variables and Time series analysis:** “RGES” package and “dismo” package (Robert J. Hijmans et al.) in R was used to calculate 19 global bioclimate variables as shown in table 1 from 1979 to 2019. Then TerrSet was used to create time series of bioclimate variables raster images and to explore those correlations with a linear trend. In this study, I mainly focused on the monotonic trend (Mann-Kendall), a trend indicator that measures the degree to which a trend is consistently increasing or decreasing, having a range from -1 to +1.

**Identifying Priority Conservation Areas:** I used bird distribution range dataset to calculate the bird diversity on each pixel in 2019, then reclassified it into 3 using Natural Breaks. I calculated the mean values and standard deviation values of monotonic trends for each 19 bioclimate variables and used them to reclassify each of 19 monotonic trends into 3 classes. Combining the reclassified temporal change for every 19 bioclimate variables with reclassified birds’ diversity, I got the 19 kinds of global Priority Conservation Areas for birds based on 19 bioclimatic variables.

**5. Discussion and Conclusion**

- **Fig (a) showed**, except for Greenland and Antarctica, generally, the total number of different bird species on lands is higher than that on oceans.
- **Fig (b) showed** in the central part of Africa (e.g., South Sudan, Uganda, the Democratic Republic of the Congo, Angola ) and center of China(near Sichuan and Chongqing), more than 9 of 19 kinds of Priority Conservation Areas maps identified those areas as High Priority Conservation areas.
- **Fig (c) showed** a similar spatial pattern to the spatial pattern in Fig (b) that Median Priority Conservation Areas were identified in more than 13 kinds of maps. Besides those areas mentioned above, the middle of South America, as well as the northern coastal part of Indonesia and Papua New Guinea, are also included.

**References:**