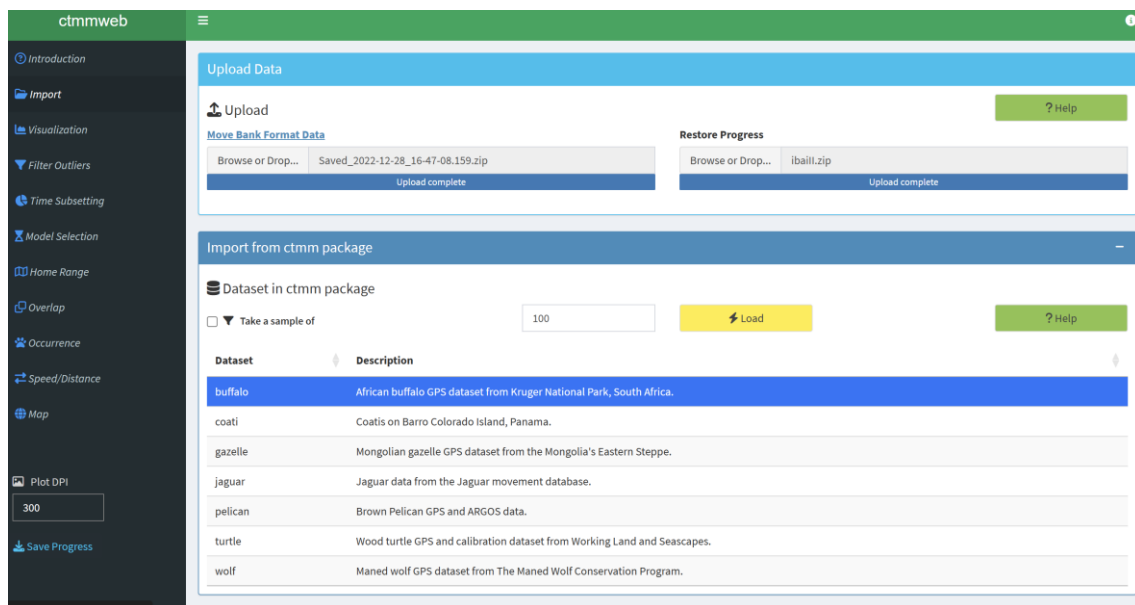


The following screenshots show what is seen during the process of the calculation of the ranging areas (RAs) of the fledglings with the web app of ctmm. Further readings, theoretical and coding background, and uses of this graphical interface can be found here:

Calabrese, J. M., Fleming, C. H., Noonan, M. J., & Dong, X. (2021). ctmmweb: A graphical user interface for autocorrelation-informed home range estimation. *Wildlife Society Bulletin*, 45(1), 162-169.

First, we import the data from Movebank, modify it (see Methods section), and import it to the web app:



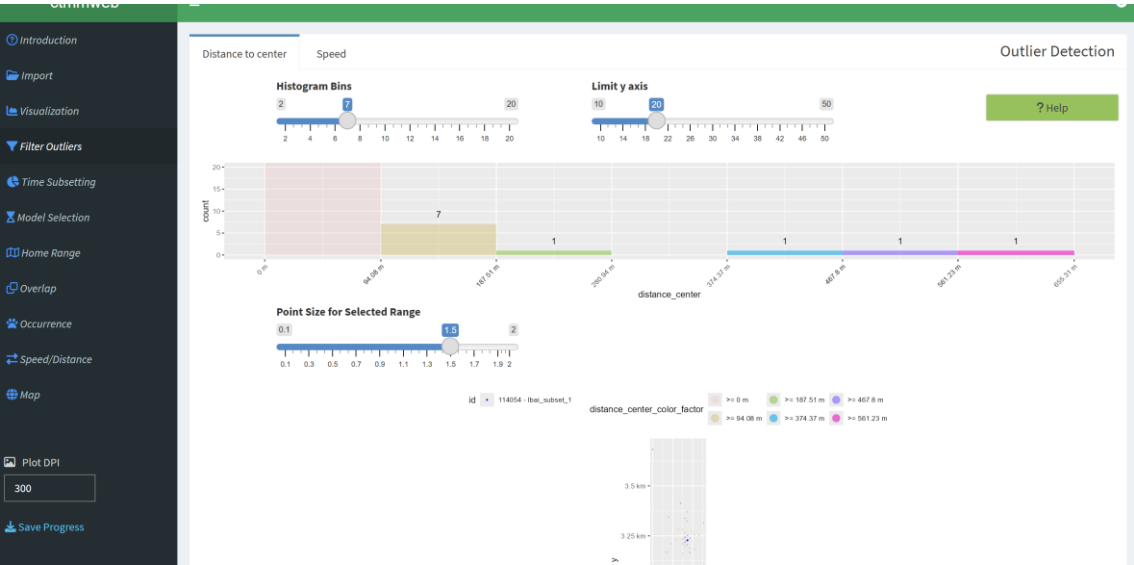
Now, at the tab “Time Subsetting”, we can divide the dataset weekly (or in the preferable time lapse), so new subsets of movement data are created. In this case, the original dataset is the one on top, and the others are numbered. On each row, one can find the duration of it, the number of days that it lasts, the number of location points, and the interval between points.

The screenshot shows the ctmmweb web application interface with the 'Time Subsetting' tab selected. The sidebar is the same as in the previous screenshot. The main content area has a green header with 'ctmmweb' and a menu icon. Below the header, there is a 'Delete Selected' button and a 'Search:' input field. Below this is a table of movement data subsets.

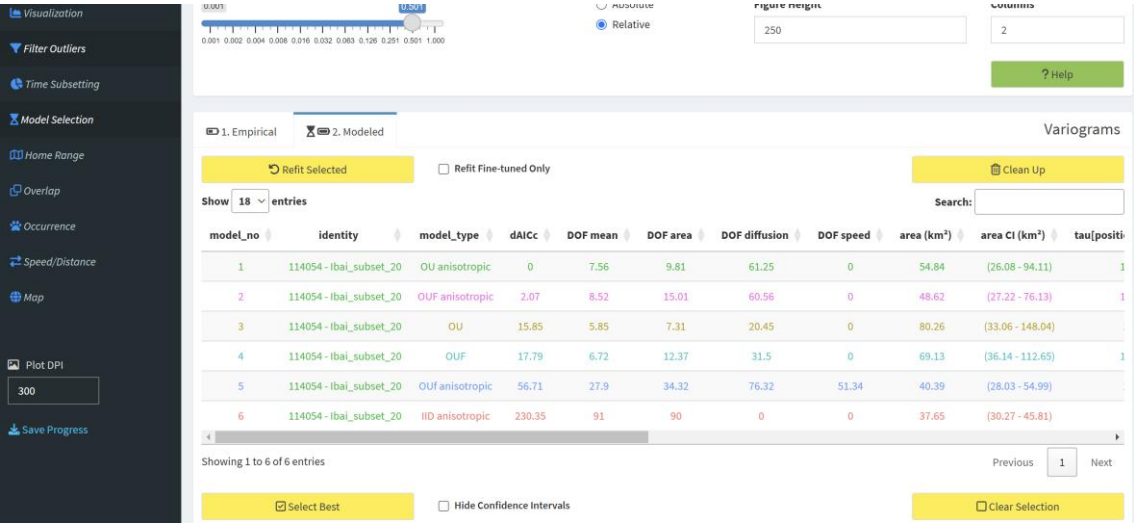
identity	start	end	interval (hours)	duration (days)	points	calibrated
114054 - lbai	2022-02-23 13:00	2022-12-28 10:00	1	307.87	4136	no
114054 - lbai_subset_1	2022-02-24 04:00	2022-03-02 23:00	1	6.79	112	no
114054 - lbai_subset_10	2022-04-28 04:00	2022-05-04 21:00	1	6.71	87	no
114054 - lbai_subset_11	2022-05-05 04:00	2022-05-11 21:00	1	6.71	82	no
114054 - lbai_subset_12	2022-05-12 04:00	2022-05-18 21:00	1	6.71	88	no
114054 - lbai_subset_13	2022-05-19 04:00	2022-05-25 21:00	1	6.71	91	no
114054 - lbai_subset_14	2022-05-26 04:00	2022-06-01 21:00	1	6.71	88	no
114054 - lbai_subset_15	2022-06-02 04:00	2022-06-08 21:00	1	6.71	91	no
114054 - lbai_subset_16	2022-06-09 04:00	2022-06-15 21:00	1	6.71	82	no
114054 - lbai_subset_17	2022-06-16 04:00	2022-06-22 21:00	1	6.71	91	no
114054 - lbai_subset_18	2022-06-23 04:00	2022-06-29 21:00	1	6.71	91	no
114054 - lbai_subset_19	2022-06-30 04:00	2022-07-06 21:00	1	6.71	91	no
114054 - lbai_subset_2	2022-03-03 04:00	2022-03-09 23:00	1	6.79	109	no
114054 - lbai_subset_20	2022-07-07 04:00	2022-07-13 21:00	1	6.71	91	no
114054 - lbai_subset_21	2022-07-14 04:00	2022-07-20 21:00	1	6.71	91	no
114054 - lbai_subset_22	2022-07-21 04:00	2022-07-27 21:00	1	6.71	91	no

By selecting any of these rows (files), we can do the following: filter outliers, select models, calculate the home range and (if you select two or more rows), use the overlap function to estimate how much area coincides with that of the other files.

Filter outliers. You can select (and remove) any outlier, based on distance to the center of the points of the file, or by speed.



Model selection. By clicking on “Modelled”, the web interface examines the different movement models (OU, OUF, IID... see Calabrese et al. 2021), and sorts them by the AIC. The models have all the information needed (DOF of all parameters, tau position, tau velocity...), and you can choose whichever fits better with your data (theoretically, you choose the one with the lowest AIC). In the case of this paper, we always used OU, and OUF, models, which are the ones that best estimate the ranging areas (IID would be closer to a classic KDE, which we did not use because it is highly biased and tends to underestimate the ranging areas).



Home range estimation. Once you select the model, you click on the tab “Home Range”, and the interface calculates it. You can save it, compare it with others, and make analyses on the overlap.

