METADATA: DEPOSIT OF FILES IN RESEARCH DATA LEEDS

Dataset title: **Lisflood-based estimates of hydro-climatic suitability for malaria transmission in Africa (1971-2100)**

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Roles
Mark Smith is the contact author for the journal paper submission and the lead author and conducted the majority of data analysis. Lorenzo Alfieri, Ad De Roo and Berny Bisselink ran the Lisflood model. Thomas Willis worked as a post-doctoral research fellow in the FLOODMAL project and processed the daily Lisflood output for malaria suitability analysis. Mark Trigg and Dai Yamazaki worked on preliminary hydrological analysis and helped design the coupling of malaria suitability modelling with hydrological model output. William James processed population data used herein. Mark Macklin, Andrew Hardy and Chris Thomas worked on the related NERC projects HYDROMAL and FLOODMAL where the ideas for this work were created. Chris Thomas was PI of both of these projects.

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HYDROMAL: Hydro-dynamic drivers of malaria transmission hazard in Africa. Thomas, C.J., Macklin, M.J., Smith, M.W., Gamarra, J.G. Ref: NE/H022740/1
FLOODMAL. Thomas, C.J., Macklin, M.J., Smith, M.W., Hardy, A.J. Ref: NE/P013481/1.

Academic subject
Geography

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Dataset abstract:
Estimates of climatic suitability for malaria transmission in Africa over the periods 1971-2005, 2011-2040, 2041-2070 and 2071-2100. Seven climate projections using the high concentration scenario (RCP 8.5) were produced with EC-EARTH3-HR v3.1 by the Swedish Meteorological and Hydrological Institute (described in the Excel workbook). These were used to run the Lisflood hydrological model at 0.5 degree resolution and estimate hydro-climatic suitability for malaria transmission based on the Mordecai temperature ranges and Lisflood-predicted surface water availability. For each time period and each of the seven GCMs (i.e. 28 rasters) a 0.5 degree raster layer of the 'number of suitable months for malaria transmission' over Africa is presented in the form of a Geotiff. An Excel spreadsheet summarises these files in terms of total area in each 1 month category for the Lisflood estimates and the estimated changes in suitability between time periods. The population estimated to live within areas hydro-climatically suitable for malaria transmission is also presented, incorporating both present day estimates and future predictions. These data are broken down by country and summarised in terms of 'population months' for each time period.

FILE:	**Lisflood-based estimates of hydro-climatic suitability for malaria transmission in Africa (1971-2100)**
CONTENTS:	EXCEL Workbook with estimates of climatic suitability for malaria transmission in Africa over the periods 1971-2005, 2011-2040, 2041-2070 and 2071-2100
AUTHORS:	Smith, M.W., Willis, T., Alfieri, L., James, W.H.M., Trigg, M.A., Yamazaki, D., Hardy, A.J., Bisselink, B., De Roo, A., Macklin, M.G., and Thomas, C.J.
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SHEET	DESCRIPTION	LINKS TO OTHER DATA
1. Forcing Models	Details of climate data used for seven climate projects (each run at high concentration scenario RCP8.5). These are labelled r1-7 in following worksheets following numbering system outlined here	
2. Lisflood Estimated Malaria Hydro-Climatic Suitability (Area)	Area in Africa (in Mn km^2) estimated to be suitable for malaria transmission categorised by the season length in months. For each model run, three values are provided: (i) average number of months per year passing the wetness criteria "wet area"; (ii) average number of months per year passing both wetness and temerpature criteria of the Mordecai curve "climate area"; (iii) average season length per year (i.e. number of continuous months passing both wetness and temerpature criteria) "season area". Data provided for each forcing model and time period.	Geotiff files for average season length per year (iii) for each forcing model and time period are also provided separate to this EXCEL workbook.

3. Estimated Area Changes in Hydro-climatic malaria suitability season length	Change in area estimated to be hydro-climatically suitable for malaria transmission, according to Lisflood estimates for water availability and the Mordecai temperature curve. Changes classified across the forcing models by signal-to-noise ratio.	
4. Estimates of Populations in Malaria Hydro-climatically Suitable Areas (classified by average number of months season length) for each time period, forcing model and population variant	Number of individuals falling within areas hydro-climatically suitable for malaria transmission for both Total Population (a_all) and children under five years of age (a0_4). All popuylation datasets were at a resolution of 30 arc seconds. Worldpop 2015 grids used for current estimates. For future periods, WorldPop 2020 grids were scaled to match country level UN projections for the mid-point of each time period. UN high, low and medium variants shown here.	
5. Lisflood-based Population Month Estimates for Malaria Hydro-climatic Suitability by Country	The population-months (i.e. population within a grid cell multiplied by number of months hydro-climatically suitable for malaria transmission) for each time period using mean predictions of all seven forcing models and UN medium population variant. Data shown for individual countries.	