Reference Datasets

1. **Population Density –** Coastal zones support a higher population density than the hinterland with faster rates of population growth and urbanisation (Neumann *et al.* 2015). Mangrove loss is generally positively correlated to human population density (Alongi 2002) with conversion of mangrove to urban areas and industrial developments observed (Richards & Friess 2016). Original data from: Center for International Earth Science Information Network – CIESIN – Columbia University. 2017. Gridded Population of the World, Version 4 (GPWv4): Population Density, Revision 10. Palisades, NY: NASA Socioeconomic Data and Applications Center (SEDAC) https://doi.org/10.7927/H4DZ068D. Accessed 1 September 2018.

2. **Protected Areas -** Original Data on protected areas are from UNEP-WCMC and IUCN (2018), Protected Planet: The World Database on Protected Areas (WDPA [On-line], [September 2018], Cambridge, UK: UNEP-WCMC and IUCN. Available at: www.protectedplanet.net

   Features that were Inscribed, Adopted, Designated, Established were selected from the database to reflect current protections. Note that these features do not necessarily reflect mangrove-specific protections, but rather fall under the broad categories of protected areas as defined by UNEP-WCMC and IUCN.

3. **Future Urbanisation -** With a growing global population the amount of people living in the coastal zone is predicted to increase to over 1 billion by 2060 (Neumann *et al.* 2015). This will further increase pressures on coastal ecosystems, including mangroves. However, this will also increase the potential benefits from restoring areas of mangrove. Original data from Seto et al. (2012), accessed at https://urban.yale.edu/data. Seto et al. (2012) created spatial explicit forecasts of the potential for urban land conversion across the globe for the year 2030. Forecasts were created using models of urban expansion based on gross domestic product and urban population disaggregated based on a land-change model (Seto *et al.* 2012). Categories from 0 to 100 correspond to pixels that may become urban with probability ranging 0 to 100. Category 101 refers to existing urban areas *circa* 2000 based on the global urban extent map from MODIS Land cover Product version 5 (Schneider *et al.* 2009; Friedl *et al.* 2010) and were removed from this dataset for display on this app.

4. **Drought Variability –** Global climate change is predicted to result in increased frequency, duration and severity of drought episodes (Allen *et al.* 2010; Dai 2013). The impact of increased drought on mangroves could be manifest via various pathways including increases in groundwater and soil salinity (Drexler & Ewel 2001), altering

surface elevation through soil compaction (Krauss *et al.* 2014) and heat and water stress (Lovelock *et al.* 2009; Duke *et al.* 2017). Extreme drought conditions have been linked to the die back of mangroves in the Gulf of Carpentaria, Australia (Duke *et al.* 2017) and the Gambia River (Spalding *et al.* 2010). Global monthly drought data in the form of the self-calibrating Palmer Drought Severity Index (scPDSI) was used (van der Schrier *et al.* 2013; Osborn *et al.* 2016, 2017). scPDSI is an index of soil moisture availability calculated using precipitation and temperature time series in combination with soil and surface characteristics (van der Schrier *et al.* 2013). The 1901 – 2016 monthly drought data was downloaded from https://crudata.uea.ac.uk/cru/data/drought/#global. The data for the years 1997 to 2016 was extracted and converted into a raster stack. To assess drought variability the standard deviation of each pixel was calculated across the 240 monthly values. The value nearest to the mangrove typology centroid was calculated.