**Supplementary Materials**

**Appendix S1**

**Quantifying seasonal flooding**

We obtained Sentinel-1 GRD data for May to November for 2015-2019 to monitor the extent of flooding during these seven months. We performed supervised classification on the Sentinel-1 data (10-m pixel resolution) in Google Earth Engine to produce the Water/No-Water maps (resampled to 30-m resolution), for each month over the six-year period. The yearly inundation duration for each pixel is then the number of months (0 to 6) in a year the pixel was inundated. We then computed the mean annual inundation for the 5-year period 2015 to 2019 for each pixel and named the variable as *Mean Annual Inundation*. This mean annual inundation map provides the spatial distribution of flood stress and may be in part determined by soil hydrology and topography.

**Fire Frequency**

To derive fire frequency, we used data from the Moderate Resolution Imaging Spectroradiometer (MODIS), which provides near-real-time 'active fire' data (data code MCD14DL) with the location, date, and time of each ‘active fire’ event. The spatial resolution for this data is 375-m. These data are available from October 2000 to the present day and are accessible from NASA's automated Fire Information for Resource Management System (FIRMS). We derived the cumulative fire density (events per area) map, for each cell in a 500-m grid for the park. We created two fire density maps: one with events cumulated over 19 years to derive long-term fire history and another for the last two years to characterize current fire history. We thus derived two fire-related variables, *Fire-frequency (19Y)* and *Fire-frequency (2Y)*, based on long term (19 years) or short-term (2 years) respectively.

**Elevation and Slope**

The *Elevation* data was acquired from the ASTER DEM 30-m resolution map. The *Slope* was calculated at the same spatial resolution using the DEM map.

**NDVI (Normalized Difference Vegetation Index)**

NDVI measures plant greenness so it varies with season. Vegetation absorbs red light and reflects back in the near-infrared, and this extent of scattering is dependent on vegetation conditions (e.g., leaf area index). The differential reflectance of near-infrared and red band emission is measured by the optical sensor of the satellite and used to determine NDVI. It ranges from -1 to +1; a large negative value represents the lack of vegetation (e.g., water bodies), and values approaching +1 indicate

dense forest with high leaf area index. We used Landsat 8 OLI data to calculate *NDVI* *pre-monsoon* (February/March) and *NDVI post-monsoon* (November) dates and used both as predictors. The spatial resolution of Landsat 8 OLI data is 30-m and so the derived NDVI data also has a spatial resolution of 30-m. We calculated NDVI for three years (2018–2020) and used the mean value of the three years for each pixel to create two maps: a pre-monsoon NDVI map, a post-monsoon NDVI map.

The detailed information of the Landsat 8 OLI images used for the pre-monsoon and post-monsoon NDVI calculations are as following:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Year** | **Pre-Monsoon Date** | **Path/Row** | **Post-Monsoon Date** | **Path/Row** |
| 2018 | 21/02/2018 | 137/042 | 20/11/2018 | 137/042 |
| 2019 | 12/03/2019 | 137/042 | 23/11/2019 | 137/042 |
| 2020 | 27/02/2020 | 137/042 | 25/11/2020 | 137/042 |

**NMDI**

 NMDI is a moisture content indicator for soil and vegetation. NMDI was calculated using red, infrared, and short-wave infrared Landsat OLI bands for February, the driest month of the year. We calculated NMDI for three years (2018–2020) and used the mean value of the three years for each pixel to create the peak dry-season NMDI map. We used the February/March Landsat 8 OLI images of 2018-2020 (same images that we used to calculate pre-monsoon NDVI) to calculate *NMDI*.