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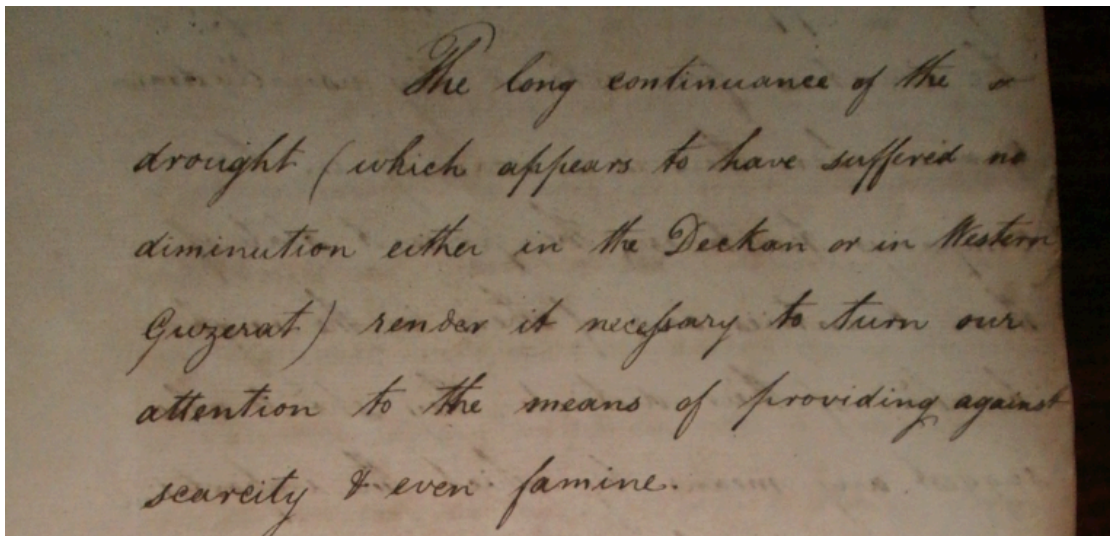
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University of Sussex

## Research Statement for Conference at University of Sussex

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Our team, based at the University of Brighton (UK), are involved in the historical climatology of tropical regions. This has predominantly focussed on southern Africa but has also recently involved work into western India. We have pioneered the use of missionary and colonial documents as records of climate variability (Figure 1), which are particularly useful in areas without a strong written tradition. Due to the nature of the materials involved our research focuses predominantly on the 19<sup>th</sup> century.



**Figure 1: Minutes of the Grain Committee of the Bombay Presidency, October 1824**

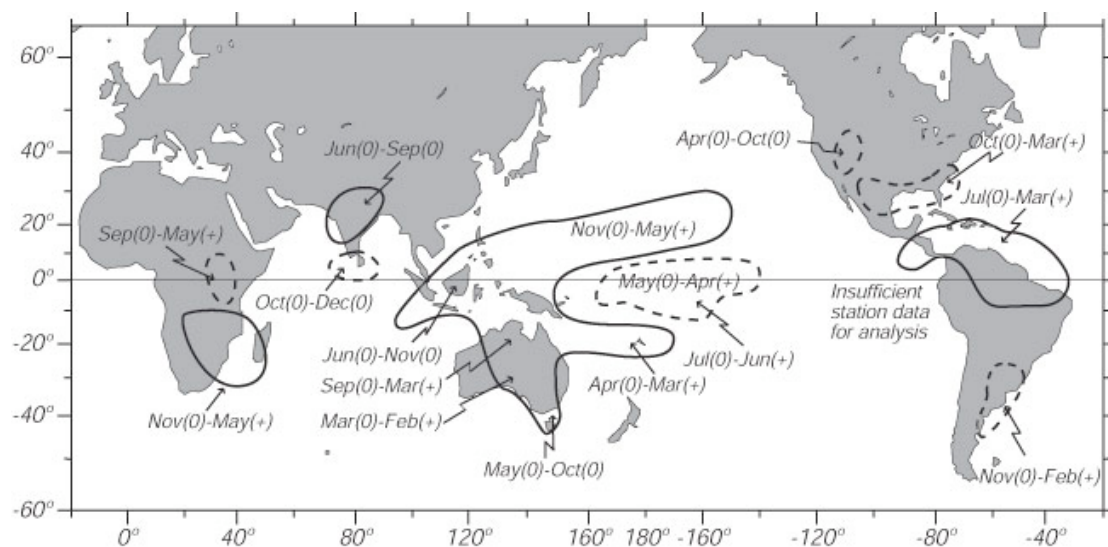
Our research encompasses all forms of historical climatology (Brázdil et al., 2005), namely:

- The reconstruction of spatial and temporal patterns of weather, climate and climate-related natural disasters;
- The vulnerability of past societies and economies to climate variations, climate extremes and natural disasters; and,
- Past discourses and social representations of climate

Within the first objective our research focuses predominantly on developing indices of precipitation and temperature variability. The sources that we use are necessarily diverse; therefore we adopt a content analysis methodology (Moodie and Catchpole, 1976) to produce a seasonal or monthly climatic severity parameters based on the material within the documents consulted. This has generally comprised of a 5-point

classification system, ranging from -2 (very dry/cold) to +2 (very wet/warm). These are calibrated with early instrumental data, which produces a very high proxy skill in comparison with other reconstruction methods such as tree-ring or coral-based reconstruction (Neukom et al., in preparation).

Our first precipitation series was developed for the Kalahari Desert in Botswana (Nash and Endfield, 2002). Since then we have developed further precipitation series for Lesotho (Nash and Grab, 2010) and western India (Adamson and Nash, in review) and a cold-season temperature reconstruction for Lesotho (Grab and Nash, 2010). Recently we have also generated a reconstruction of monsoon onset data over Mumbai dating back to 1781, which has highlighted recent changes in onset date (Adamson and Nash, 2012). Our reconstructions allow for the analysis of global climatic forcing such as El Niño Southern Oscillation (ENSO).



**Figure 2:** Regions experiencing enhanced rainfall (dashed lines) or drought (solid lines) in association with El Niño events. (0) indicates that rainfall levels change typically during the El Niño year, and (+) that changes occur during the year after the onset of the El Niño event (after Ropelewski & Halpert, 1987).

Recently we have been working on the Leverhulme Trust funded *ENSOAfrica* project to analyse ENSO-related climatic variability and associated social responses in Madagascar, Malawi and Kwa-Zulu Natal. This is of particular interest given the dipole in ENSO responses between southern and central-eastern Africa (see Figure 2). Our project has analysed British, American, German, French and Norwegian missionary records, British and French colonial records and English-language periodicals published in the area of study. We also currently have grant applications being considered for research in south India and West Africa.

In terms of social responses to climate our research has focussed predominantly on personal and cultural narratives of climate (Endfield and Nash, 2002, 2005, 2007; Adamson, 2012) rather than vulnerability. This is due to the nature of the missionary sources consulted, which are highly biased and can prove difficult as 'objective' data on indigenous vulnerability. Recent work using colonial sources has generated an anatomy of vulnerability in colonial western India, however (Adamson, unpublished PhD thesis), and social vulnerability is a major aim of the *ENSOAfrica* project.

Our research is naturally collaborative, being situated at the boundaries of geography, history and climatology. The *ENSOAfrica* project incorporates collaboration with Prof. Dominic Kniveton at the University of Sussex to incorporate modelling into documentary climate reconstruction. We also work



closely with Prof Georgina Endfield, an environmental historian based at University of Nottingham. International partners include the ACRE project, Indian Meteorological Department, Royal Geographical Society and the University of the Witwatersrand, Johannesburg. Prof. Nash was recently involved in a collaborative project between geographers, geochemists and archaeologists to investigate the provenance of stone tools manufactured by early-modern humans in the Kalahari Desert (Nash et al., in review). Dr Pribyl joined the team from University of Bern, Switzerland, where she undertook historical climatology research using medieval English farmers' diaries (Pribyl et al., 2012). Dr Adamson is also the administrator of the network "*Collaborative research on the meteorological and botanical history of the Indian Ocean, 1600-1900*", to which this conference pertains.

Our work does not incorporate and specific digitisation. However, the archive material that we consult is entered into a specially constructed database, which allows quotations to be coded regarding the information contained within. This includes data on climate variability, meteorological hazards and social responses. It is envisaged that this database will eventually be made open-access.

In terms of collaboration with other disciplines, our research would benefit significantly through work with anthropologists and through closer collaboration with dendrochronologists. Work that incorporates ships-log based climate reconstruction and land-based chronologies would be particularly useful. Lastly, research onto indigenous-language archives, particularly in India, would add significant value to historical climatology, which has until now predominantly derived from European archives.

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