**Workshop 2**

**Questions and discussion following morning talks:**

Standardisation

* Standardisation of (weather) indices- is it desirable to standardise globally, or to take a broad regional approach (e.g. Across monsoon regions or across Europe).
* Difficulties in standardising indices because the choice of indices is often dependent on quality of the available data (e.g. 5-point vs. 7-point indices), but potential for methodological standardisation of how the indices are applied
* need for discussion around whether we can compare indices created using a 3-point and 7-point scale.

Lessons from previous projects

* Lessons to be learnt from previous projects e.g. Local newspapers across a similar region often all contain similar stories, only a sample need to be read, need to use the language of meteorologists
* Need for broadscale collaboration and publishing (one of the aims of this network).

Do we need weather/ climate reconstructions using indices?

* Only need indices if they bring something new
* Not accepted by everyone (e.g. some meteorologists)
* Loose qualitative data
* High quality databases should be a priority
* In England we have Central England Temperature record, which can be used instead of temperature reconstruction through indices, but there is still value to rainfall, snowfall and storm reconstructions, and both instrumental and qualitative data yet to be recovered
* MET office archive has underused precipitation record form 1860s onwards

Visibility of field

* Need to demonstrate the strength of UK climatology- in extreme weather and extreme weather impacts
* Recent projects- TEMPEST and CHERISH

Project outcomes

* An aim of the project is to visualise impacts and reconstruction alongside each other
* Committee on Climate Change interested in potential impacts going forward (to 2050ish)
* Pathways approach- what impacts have happened in the past and what might happen in the future, sometimes struggle finding the evidence base for this.
* Outcome of this project could include guidance on where potential source material can be found and how to collect and use it
* Problem for academics is translating and transferring information to practitioners and decision makers (publication is not the most efficient way of doing this)

Future focus

* Already been shown that modelling data on hydrological extremes does not reflect historic extremes, and worse events can be found in the historical record
* Past reconstructions targeting archival evidence of impacts

Potential users

* Policy, climatologists and modellers
* MET office interest in bringing in physics/ physical teleconnection- this could be considered when combining indices

Reliability of indices

* Goal of CRIAS working group- separating climate from impacts, untangling the political context (climate vs non climate factors)
* Methodological concerns- a series of stages resulting in a coloured square, confidence in judgement when categorising, has been touched upon by Nash et al in publications, where rainfall series were independently created by 2 researchers and compared (with agreement on extremes of dry and wet, some variation around ‘normal’ conditions).
* Georgina Endfield has also been looking at this and will be presenting to CRIAS
* Generally, agreement around application of indices happens if there is clear guidance.
* Combining scales of records remains problematic

**Discussion 2: Indices and applications discussion**

Different disciplines/organisations and indices

* Geographers perspective- valuable tool
* SEPA use SPI for drought and impacts, warning levels trigger actions to protect water users, useful if calibrated against impacts, but dynamic and needs recalibration (like flood warnings)
  + Problems with indices and impacts- Brazdil et al have been looking at the 1842 drought in Europe, here drought impacts were more extreme than indicated by hydrometeorological indices. Extreme events and indices need more exploration, miss things like soil moisture
  + SEPA has found indices are good at an early stage, approaching drought, but impacts don’t correlate with any particular threshold and resilience is not universal (e.g. ground vs surface water sources).
  + Many drought impacts are delayed, and won’t happen in first year
* Historians perspective on indices- not normally used, seen as a simplification of qualitative information, need to be explicit about loss of complexity and nuance, recognise the value in making sources accessible across disciplines. Also issues around how events are recorded, critical approach needed.
* Also lose emotional impact etc by converting qualitative to quantitative, which is important for looking at impact and resilience to extreme events.

Importance of Context

* Context of records is important and lost in indies e.g. Missionaries writing in Africa describe things as extreme which aren’t. Need to use and compare different source and types of records.
* Media reporting of drought is inconsistent- deferral of responsibility and public perceptions. May not report consistently on extreme weather across time.
* Missionaries letters, at times told only to report on work, not weather or climate, without the letters asking them to report on these things, we might think there was no extreme weather in this period
* Need to consider changing meaning of words e.g. resilience

Using indices

* Met Office- use of indices as a communication tool, looking at climate variability and the complementing the length of record
* Numbers can be meaningless, also work ongoing turning numbers into pictures
* Indices convert disparate qualitative data into numbers, or make lots of quantitative data understandable (in both cases there is a loss of information, but product is more accessible to a wider range of people)
* Indices are a common language across qualitative and quantitative research
* Committee on Climate Change use indices for impact vulnerability and actions, and are building link between climate and indicators
* Universal acknowledgement of potential value, but also caution around loss of information

What do we mean by indices?

* Different phrases- categories bands
* In climate/weather indices general movement towards 7-point system when data is available
* In Australia a 3-point system is used extensively- lack of trust in data

Use of series of indices by other disciplines

* Historians- Environmental determinism (climate driving human behaviour)- takes us further away from the lived experience
* Problems with the concept of ‘normal’
* Different audiences- storytelling for public engagement vs indices/graphs etc for policy
* Many historians have ignored or over-relied on climate data
* Interdisciplinary collaboration not universally embraced by historians, but increasing recogntion
* Normal- mathematical average? Or what normally happens?
* Assumptions have been made in the creation of indices, could be misinterpreted (but interpretation of index is likely to be easier/ better than interpretation of raw data)
* Split into categories- ordinal or equal sized?
* Need to listen to user
* Different if looking to quantify severity of extremes or frequency of extremes
* Change in severity of impacts over time e.g. flood damage to houses in 1830s vs. today very different (fitted carpets, electrical wiring etc…)

**Discussion 3: Current uses and limitations**

The intention of the next workshop (November, date tbc at the Met Office in Exeter)

* to reflect and think about how to use and communicate/engage with organisations such as the Met Office, Environment Agency etc
* look at what we are not doing so well; is data presented in the right way? How can we communicate better?

Communication

* To public? To end user?
* Need to think about audiences (perhaps produce a list of audiences- e.g. decision makers and what the data will be useful for, public, interested public)
* Audience important for thinking about potential problems (and inviting the correct colleagues (Met Office/government/modellers) to participate in the project- longevity

Formats

* What format makes data most useful (model development and evaluation)
* Visualisation- presenting material- layers so that different people can take different things from it
* Different motivations and how it effects how we present research and data
* Interest from researchers in getting feedback on how they can make their data useful to modellers etc

Uses

* How can historical climatology contribute to predictions- changes in seasons etc.
* Overlap with instrumental record
* Value for flood estimation
* Protocol should build in coproduction/ users