

FLASH DROUGHT PROJECT MEETING #5

3 JUNE 2025 AUS / 2 JUNE 2025 COL

Jess Bhardwaj

Mike Hobbins

David Hoffmann

Tess Parker

- Mike has capacity to do some targeted tasks for this project at the moment:
 - **Work on the derivations document**
 - **Work on the formula document**
 - **Find the lat/lon domain and data for the Horn of Africa case, so that Jess can reproduce**
 - **Also has the up to date code and will compare this to the sensitivity document to check**
- Jess has the reference ET working in Python on MERRA2 data.
- Jess is having a few problems with the units in the sensitivity equation. This may possibly be related to hPa vs kPa, but she will check.
- Jess has reproduced the 10-day running mean and decomposition per Mike's example (see Nov 2024 meeting notes).
- This was done over the whole domain, including ocean – Mike notes that it is better to use land points only.
- Also noted by Mike that it is odd that surface radiation is the most prominent driver – but this is a case for the nationally driest month in 1982/83 over the whole continent, and the driest area is over the northwest of Australia, and ocean points are included.
- Jess would like to check the order of operations with Mike. **OUTSTANDING ITEM**
- For presentation at AMOS, perhaps choose the Sep-Oct 2015 case study from the 2021 flash drought paper. This will allow for a storyline from Mike's sensitivity study over CONUS to the Wimmera flash drought results and then on to the decomposition of drivers results. This will be shown as WIP at AMOS.
- Mike has emailed Jess an Excel spreadsheet of data to use in checking the results for the Horn of Africa 2015/16. **COMPLETED ITEM**
- As Mike noted to Jess, when producing the time series of running averages the space dimension is collapsed; when producing spatial data the time dimension must be collapsed.
- Tess noted that the Hawkesbury Institute for Environment are interested in the driver decomposition – this can inform their vegetation models, as they are unable to model the full PM reference ET: but knowing that the particular region of interest for them is sensitive to a particular driver means that they can model the vegetation effects from that driver.
- Mike notes that wildfire experts are excited by which of the four drivers their particular fire regime responds to most dramatically: if that driver is large, e.g. heat wave or strong winds incoming, that is useful information for them. So if your extreme event is sensitive to variable x, and variable x is going to blow up, be on the alert.

- Another use of the sensitivity work is as a driver of research: e.g. if temperature is the most important driver in Victoria, then invest in researching the variability of temperature – i.e. weight research in that direction.
- Tess notes that process understanding of extreme events such as flash drying informs the analysis of current models, as well as of future projections. If a model cannot capture the drivers of e.g. flash drying, how much can we rely on future projections of changes in those events? Relevant for ACS work.
- Jess notes that the ACS projections have a broader range which includes some of our Pacific neighbours and we should extend our analyses to those regions too. BARRA has 12 km resolution and ERA5-Land has 9 km.
- Mike is working on a paper on the decomposition method, and will email us the relevant sections for comments. **OUTSTANDING ITEM**
- Our next meeting invite has been sent for Tuesday 15 July 9 am AUS / Monday 14 July 5 pm COL.
- Noting that Jess is on leave from 7 – 29 June, and David is away from 4 August – 26 September.