Past Observations Group
Rapid Response Hackathon

Dr Ben R Fitzpatrick

School of Civil Engineering, UQ
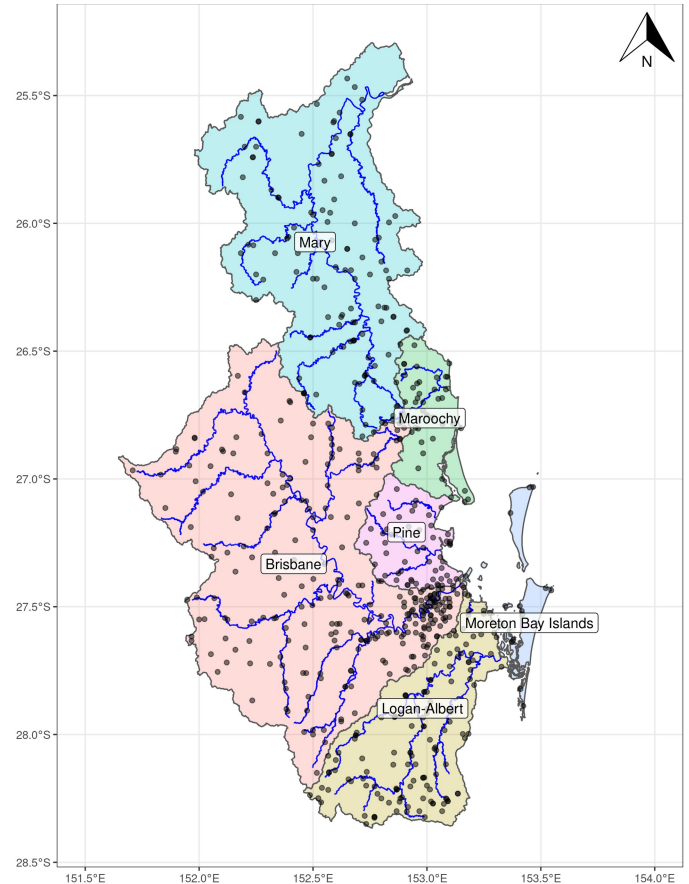
Oakes Holland

School of Biology and Environmental Science, QUT

Dr Kate Saunders

School of Mathematical Sciences, QUT

Focal Question

How did the rainfall preceding the 2022 floods differ from the rainfall preceding the 2011 floods?
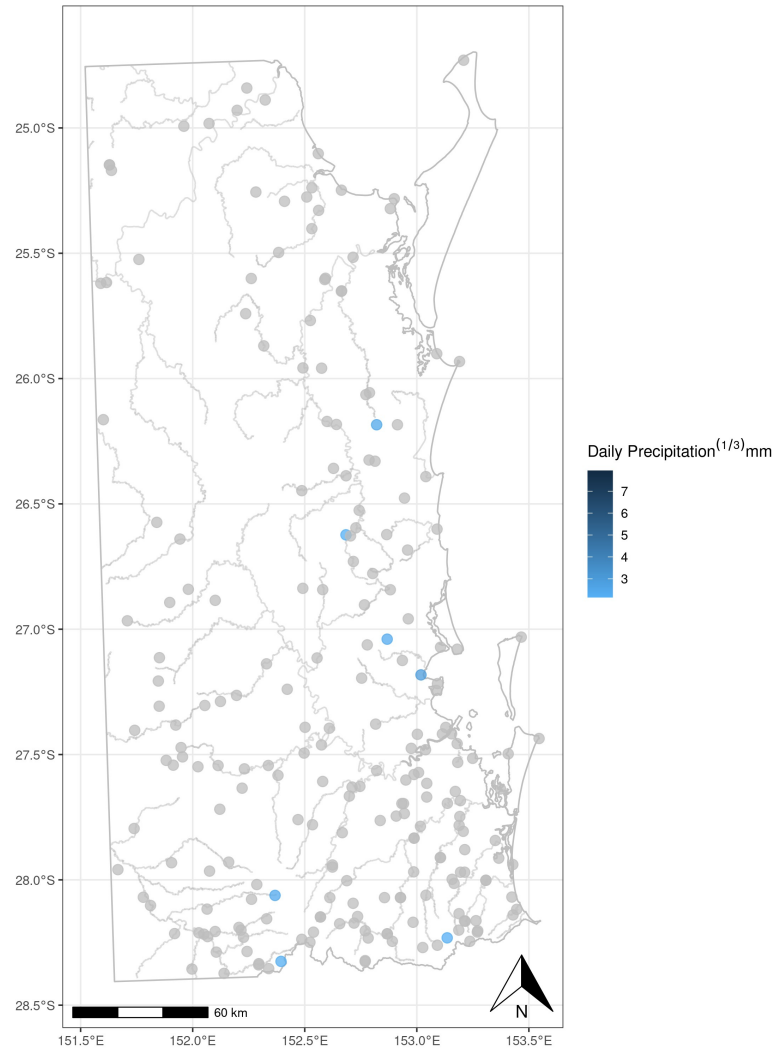
Data Used

Rainfall time series from BOM weather stations

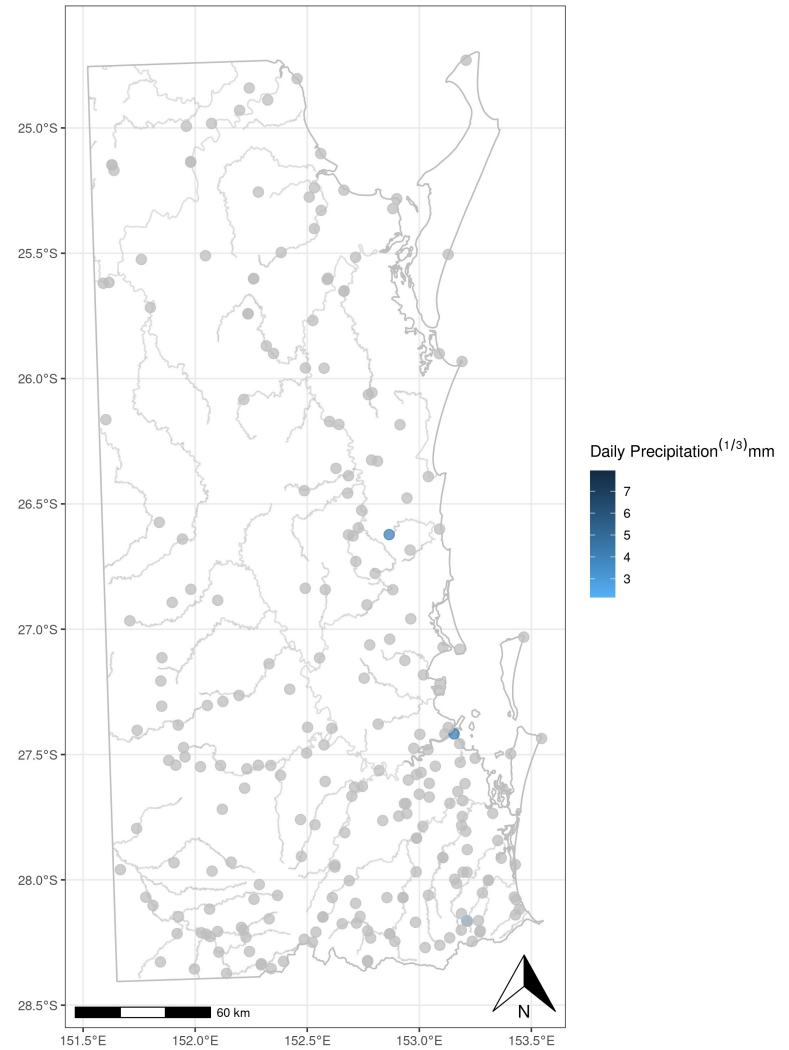(Global Historical Climatology Network daily (GHCNd) data)

Drainage Basin Boundaries

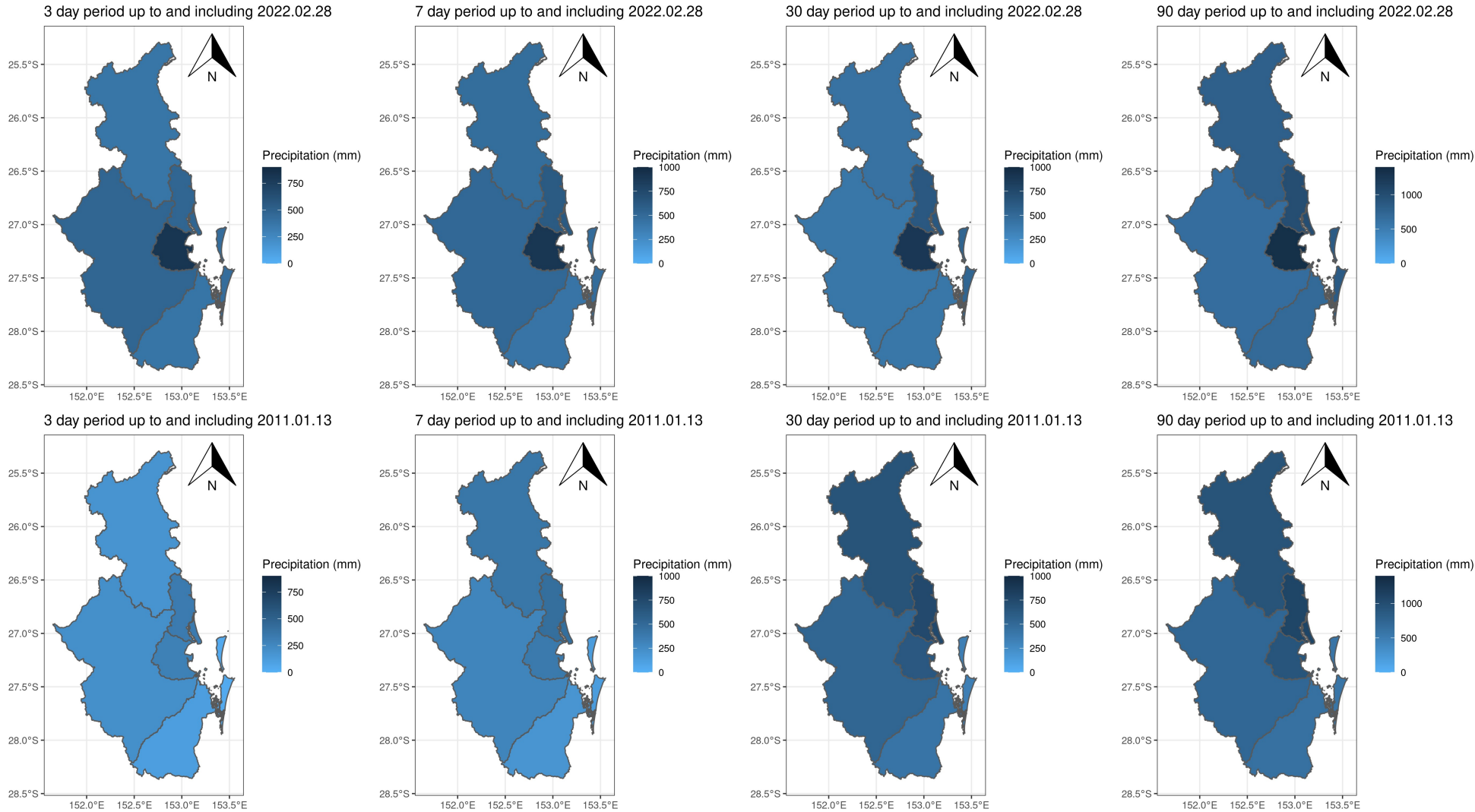(Spatial Polygons from the Queensland Government Spatial Catalogue)
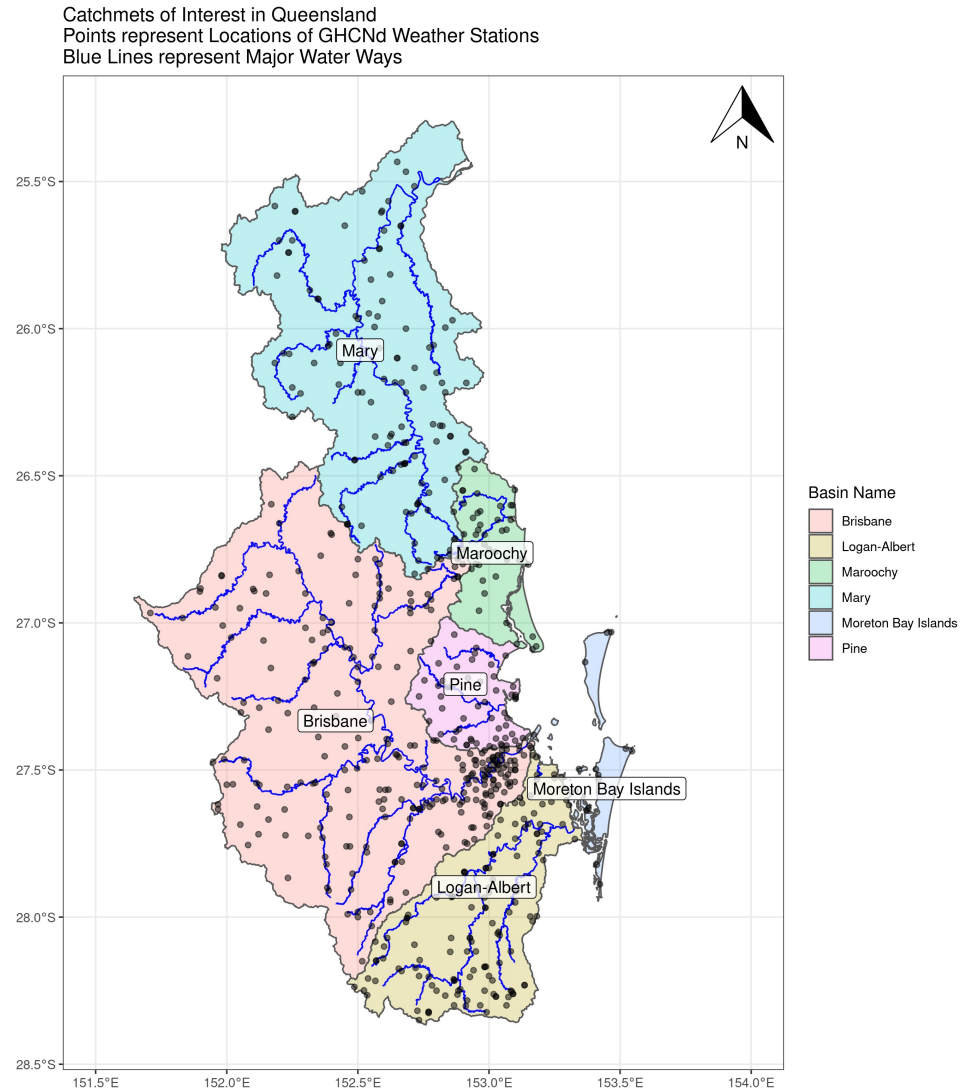
SE QLD Station Data 2010-11-25

SE QLD Station Data 2022-01-04

Catchment Level Means of Total Precipitation at Weather Stations

Task	R packages
Download global weather station metadata	rnoaa
Identify stations that spatially intersect drainage basins of interest	sf & tidyverse
Download rainfall time series for stations of interest	rnoaa
Tidy data into a simple features object (tibble with a geometry list column)	sf & tidyverse
Summarise rainfall data grouped by drainage basin & time interval	dplyr & lubridate
Join summary statistics to drainage basin boundary polygons	dplyr & sf
Plot the polygons mapping summary statistics to fill colour	ggplot2, sf, ggspatial, patchwork ...

Catchmets of Interest in Queensland
Points represent Locations of GHCNd Weather Stations
Blue Lines represent Major Water Ways

Basin Name
- Brisbane
- Logan-Albert
- Maroochy
- Mary
- Moreton Bay Islands
- Pine

R Packages Used

- rnoaa
- tidyverse (dplyr, ggplot2 …)
- lubridate
- sf
- ggspatial
- ozmaps
- patchwork

Code

Pre-Existing Code

by Kate Saunders to download, clean & summarise:

Global Historical Climatology Network daily (GHCNd) data

- https://github.com/katerobsau/conversationNSWFloods-

Hackathon Code (messy but commented)

produced the visualisations presented today

- https://github.com/katerobsau/QUTCDS_Hackathon/blob/main/comparing_extreme_events/rainfall/past_observations_group.R