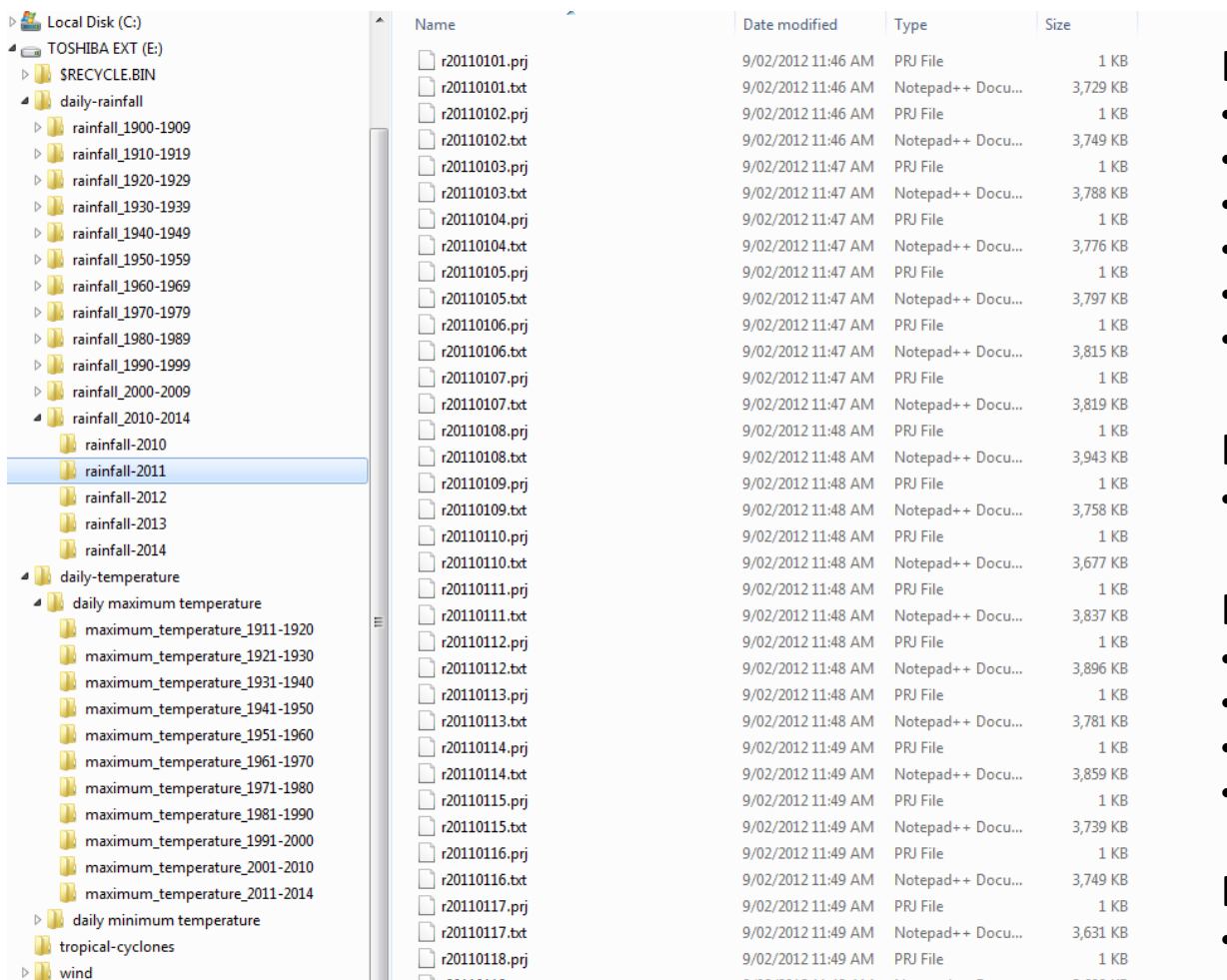


Extreme Weather Condition Analysis Using BoM Data

Dr Yiqun Chen

March 2015

BoM Historical Weather Data



Name	Date modified	Type	Size
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r20110118.txt	9/02/2012 11:49 AM	Notepad++ Docu...	3,758 KB

Data Types

- Rainfall (daily)
- Max Temperature (daily)
- Min Temperature (daily)
- Tropical-cyclones (historical aggregated)
- Wind speed (monthly aggregated)
- Wind direction (monthly aggregated)

Data Format

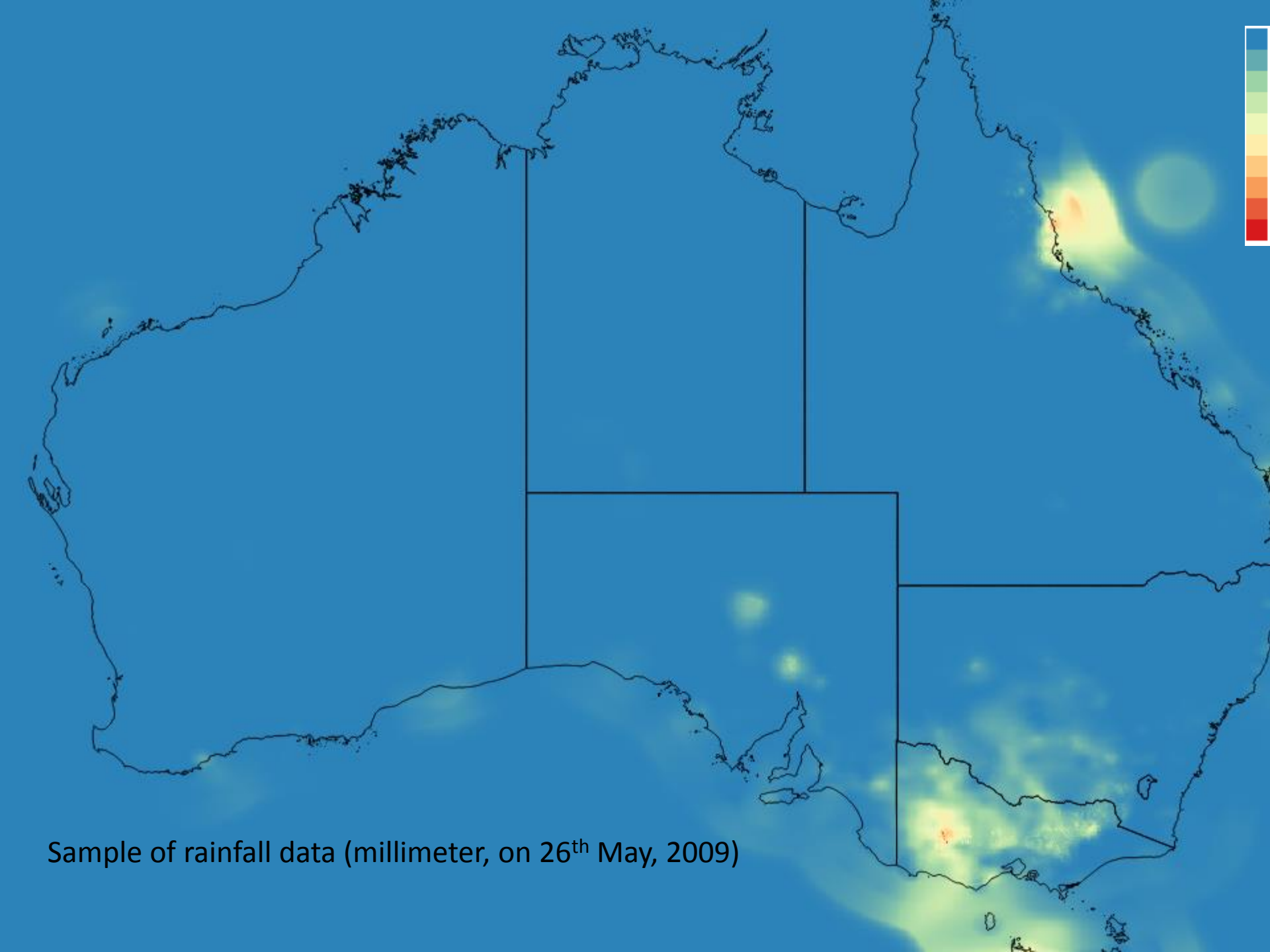
- Arcinfo grid (0.05 Arc Degree) for Australia

Data Currency

- 1900 - 2014 (rainfall)
- 1911 - 2014 (temperature)
- 1969 - 2005 (cyclone)
- 2004 - 2008 (wind)

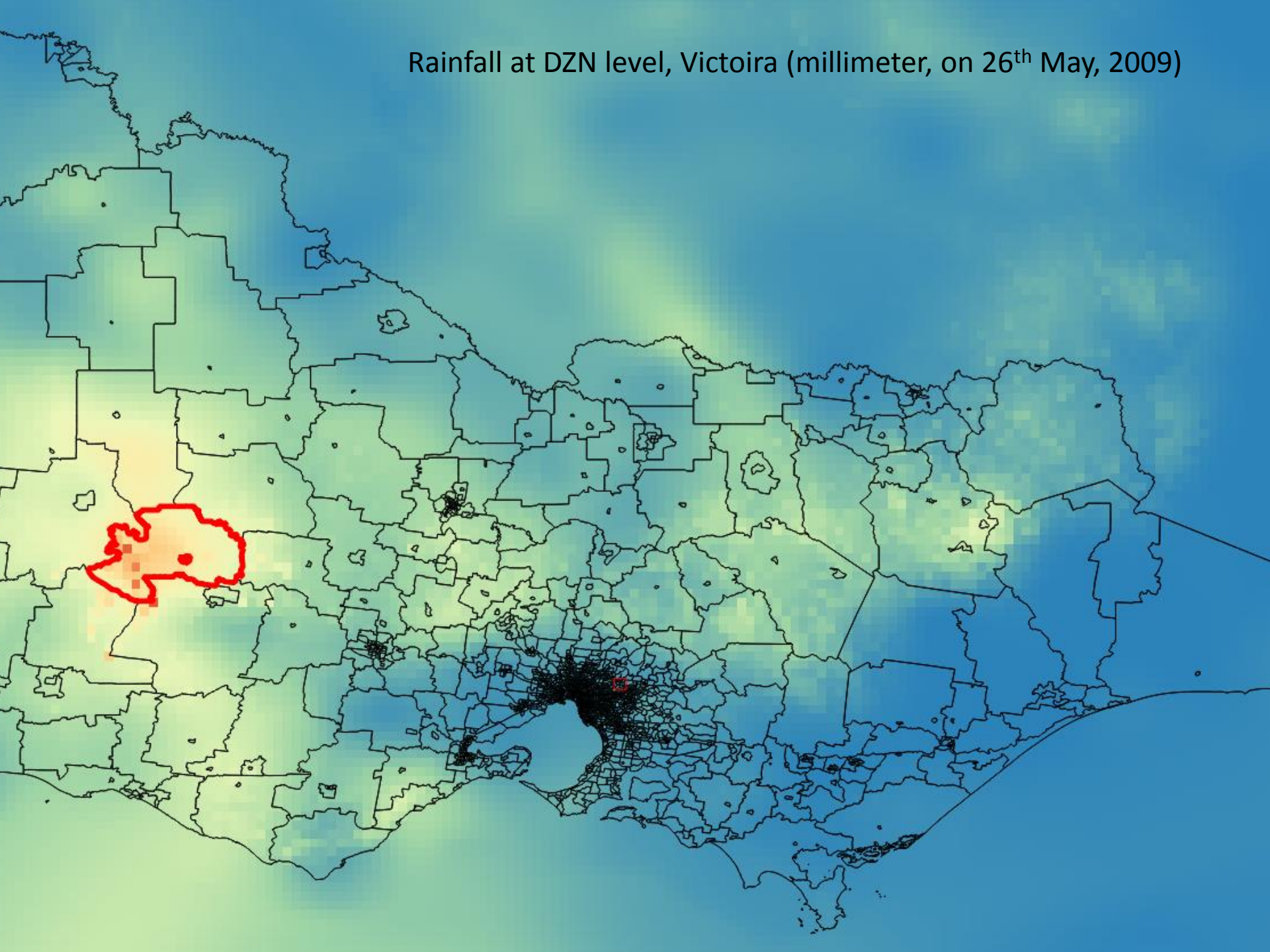
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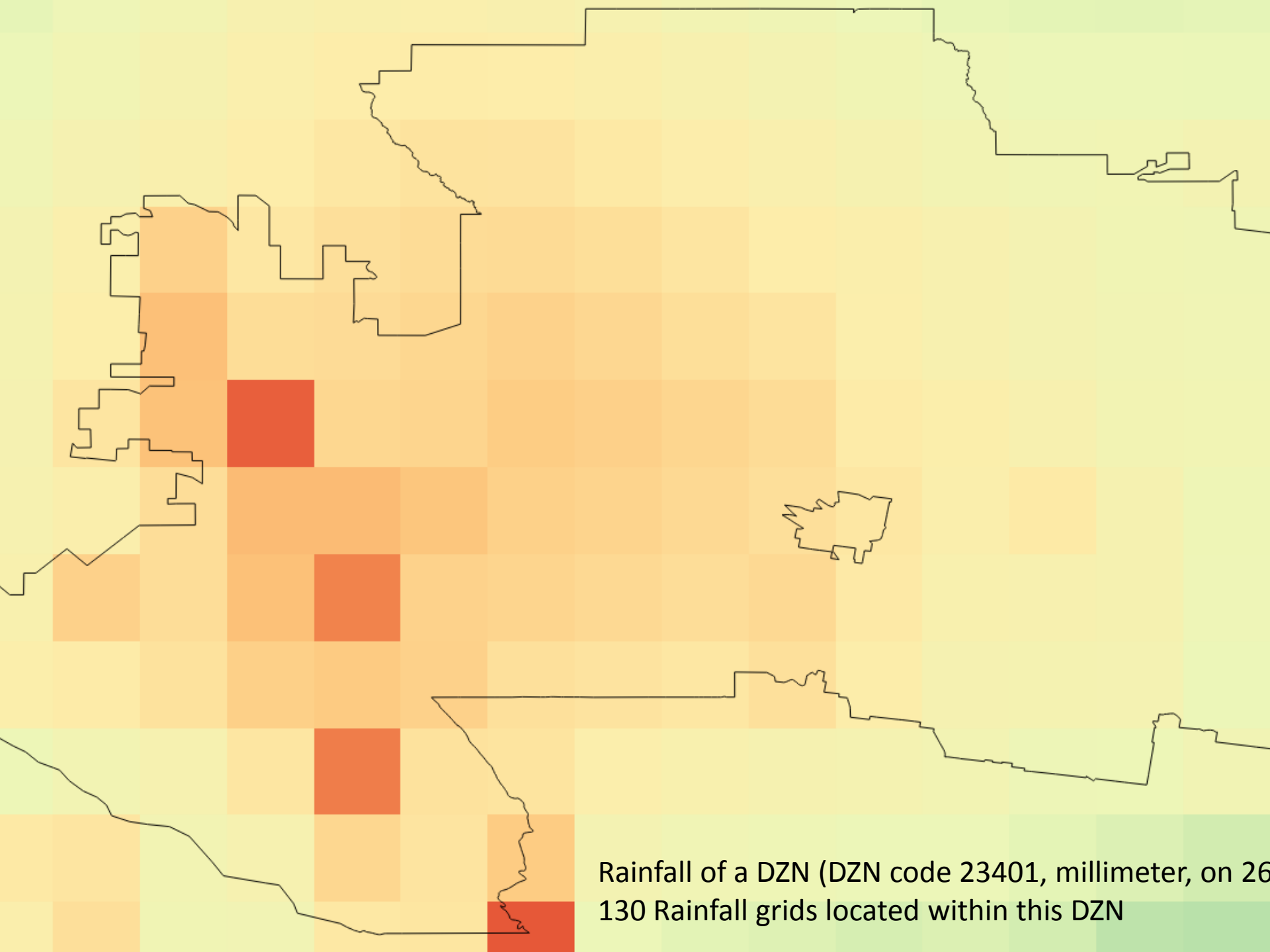
- 500GB



Sample of rainfall data (millimeter, on 26th May, 2009)

Rainfall at DZN level, Victoira (millimeter, on 26th May, 2009)





Rainfall of a DZN (DZN code 23401, millimeter, on 26
130 Rainfall grids located within this DZN

Logics for Extreme Weather Condition Computation

The DZN (23401) has 130 grids, BOM provides daily rainfall data (**daily_{rain}**) for each grid from 1900 to 2014. For each single grid, to calculate the extreme rainfall for each natural day (Jan 1 to Dec 31, 365 days in total), we need to:

- (1) compute the average rainfall (**avg_{rain}**) for that day in the past 115 years
- (2) subtract **daily_{rain}** with **avg_{rain}** to get the extreme rainfall **extreme_{rain}** for that day.

Step (1) and (2) need to repeat 365 times to compute the extreme rainfall for each natural day of each year

- (3) For each year, aggregate extreme rainfall values of each grid by summing up its 365 extreme rainfall values
- (4) For a DZN, sum up the aggregated extreme rainfall value of all grids it contains, group by each year

Final Output Format of Analysis

DZN-Code	Year	Extreme Rainfall	Number of Grids
23401	1990	15000	130
23401	1991	18000	130
23401	1992	20100	130
...
34013	1990	25000	110
34013	1991	19000	110
34013	1992	30100	110