

Climate change impacts and adaptation strategies

- Sri Lanka

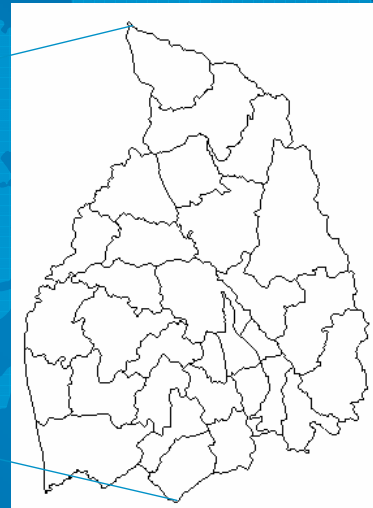
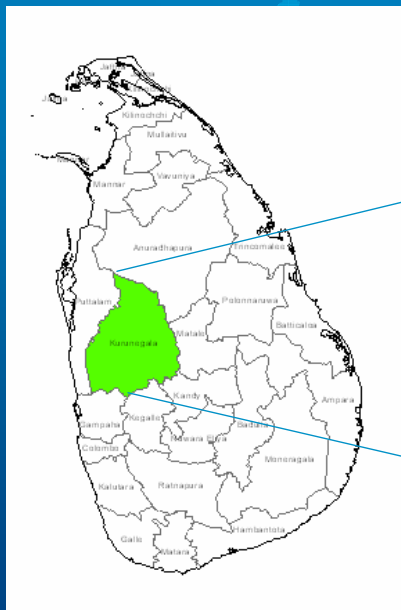
SB Weerakoon
GRAS Gunathilake

Analysis of climate change impacts and adaptation strategies for

- Floods
- - The Kelani River Basin
- Paddy cultivation
- - Kurunegala District

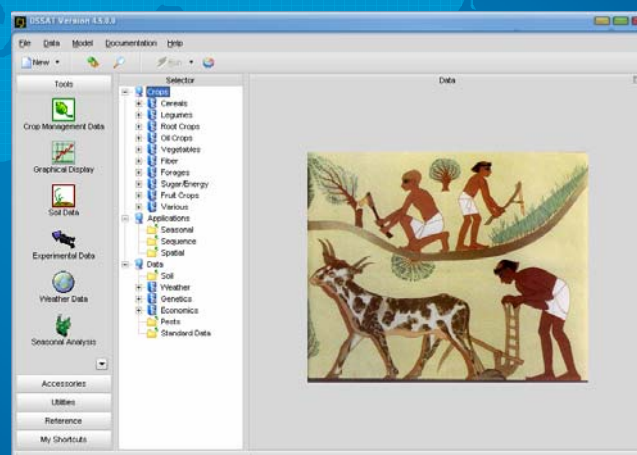
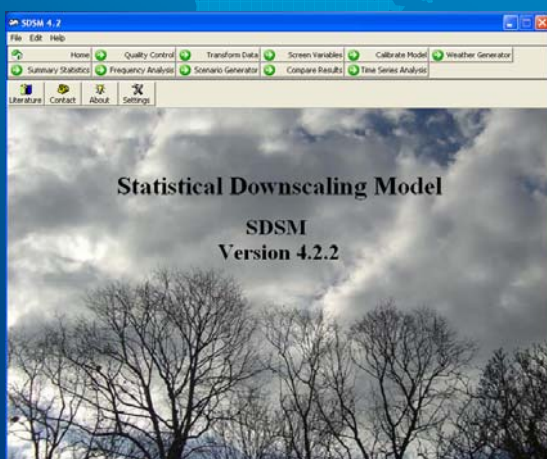
Rice production analysis

Study area - Kurunegala district

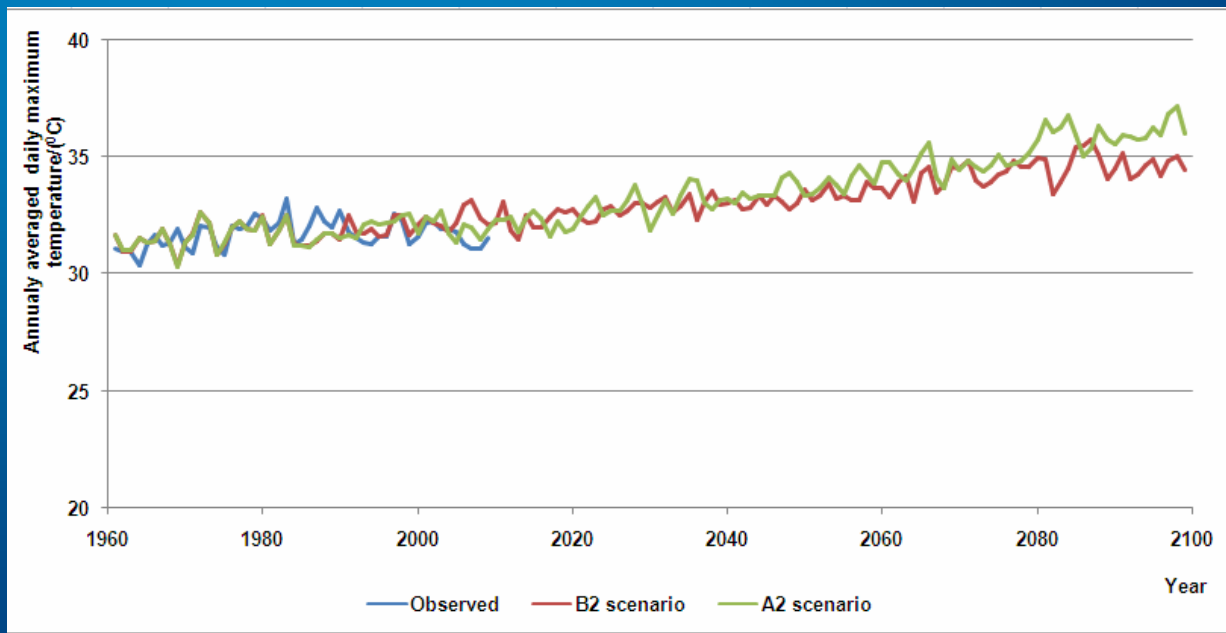


Models & Softwares Used for Rice Production Analysis

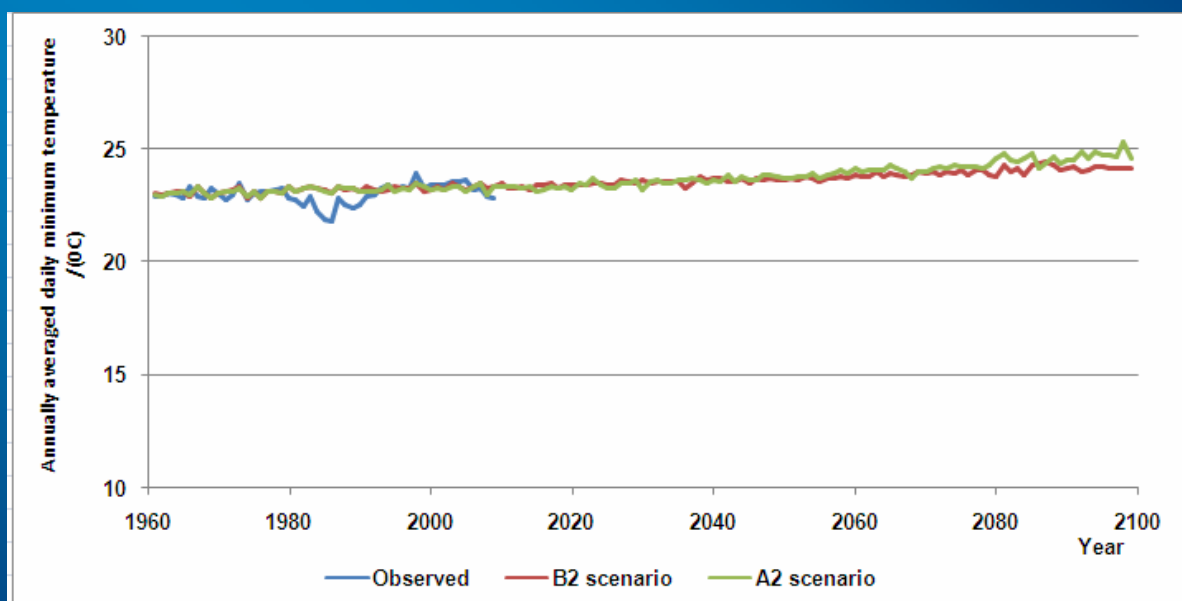
- Statistical DownScaling Model (SDSM) – For forecasting future weather
- Decision Support System for Agrotechnology Transfer (DSSAT) software – For predicting future rice yield



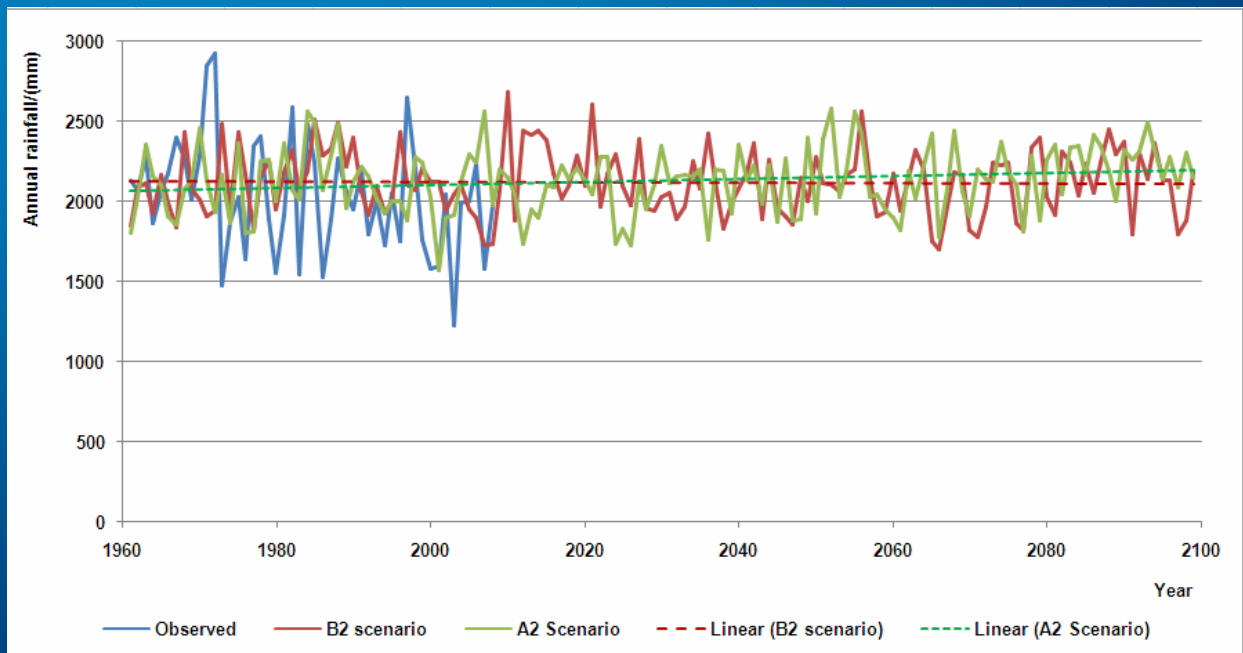
Variation of daily maximum temperature in Kurunegala district for A2 & B2 scenarios



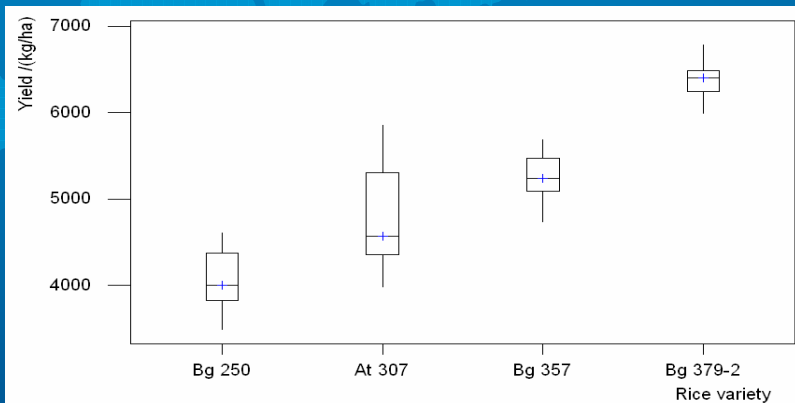
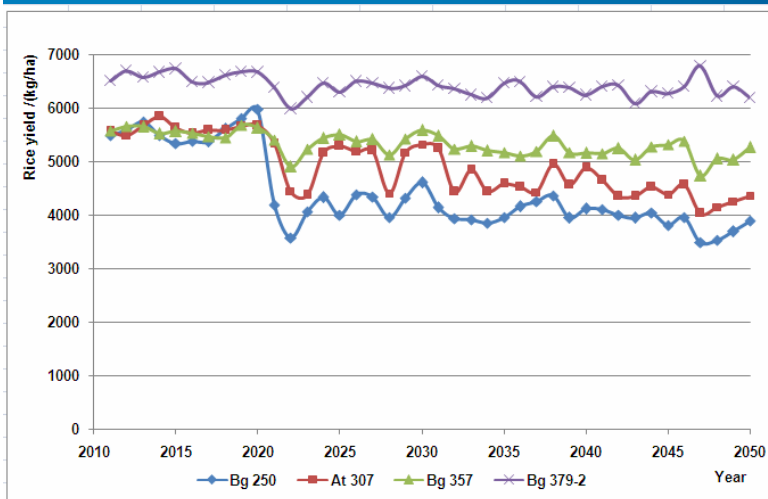
Variation of daily minimum temperature in Kurunegala district for A2 & B2 scenarios



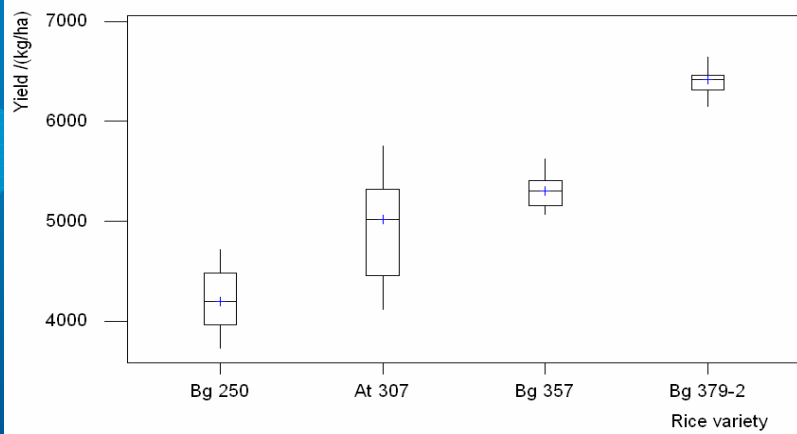
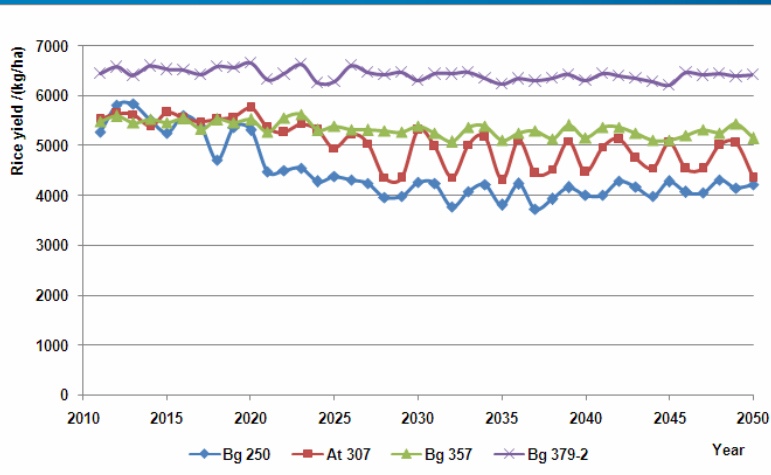
Variation of annual precipitation in Kurunegala district for A2 & B2 scenarios



Variation of rice yield with uncertainty for A2 scenario (2011-2050)



Variation of rice yield with uncertainty for B2 scenario (2011-2050)

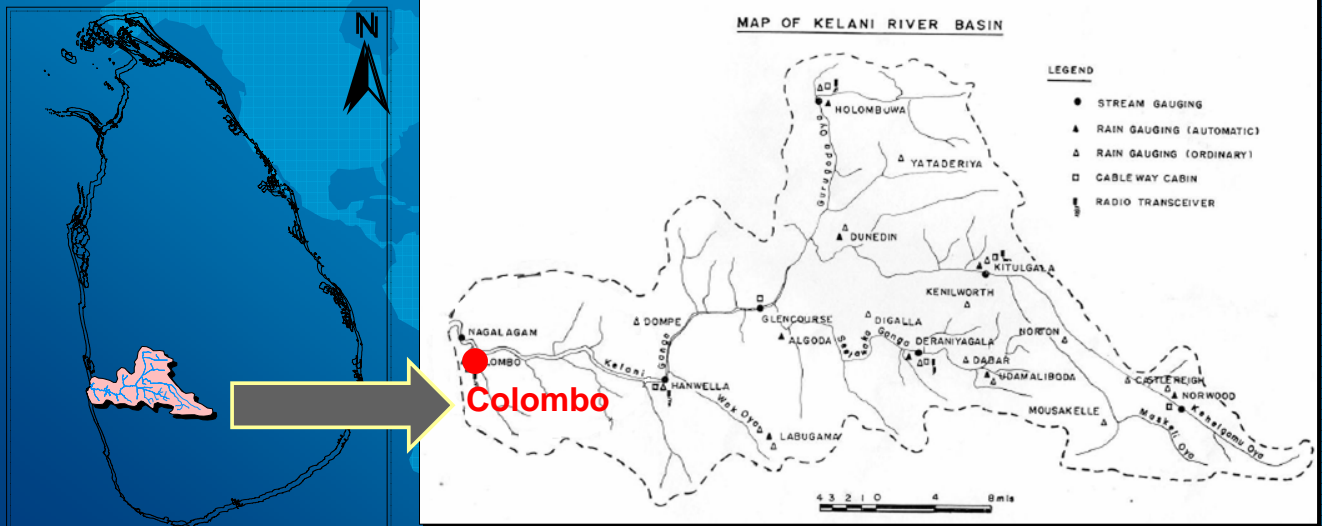


Proposed Adaptation measures

- Develop & introduce new rice varieties that tolerant to future climate conditions.
- Shift the growing season by 02-03 weeks which can avoid the high temperature periods at grain development stages.
- Introduce good water management practices
- Educate the farmers about climate change impacts.

Flood analysis

Study area - Kelani river basin

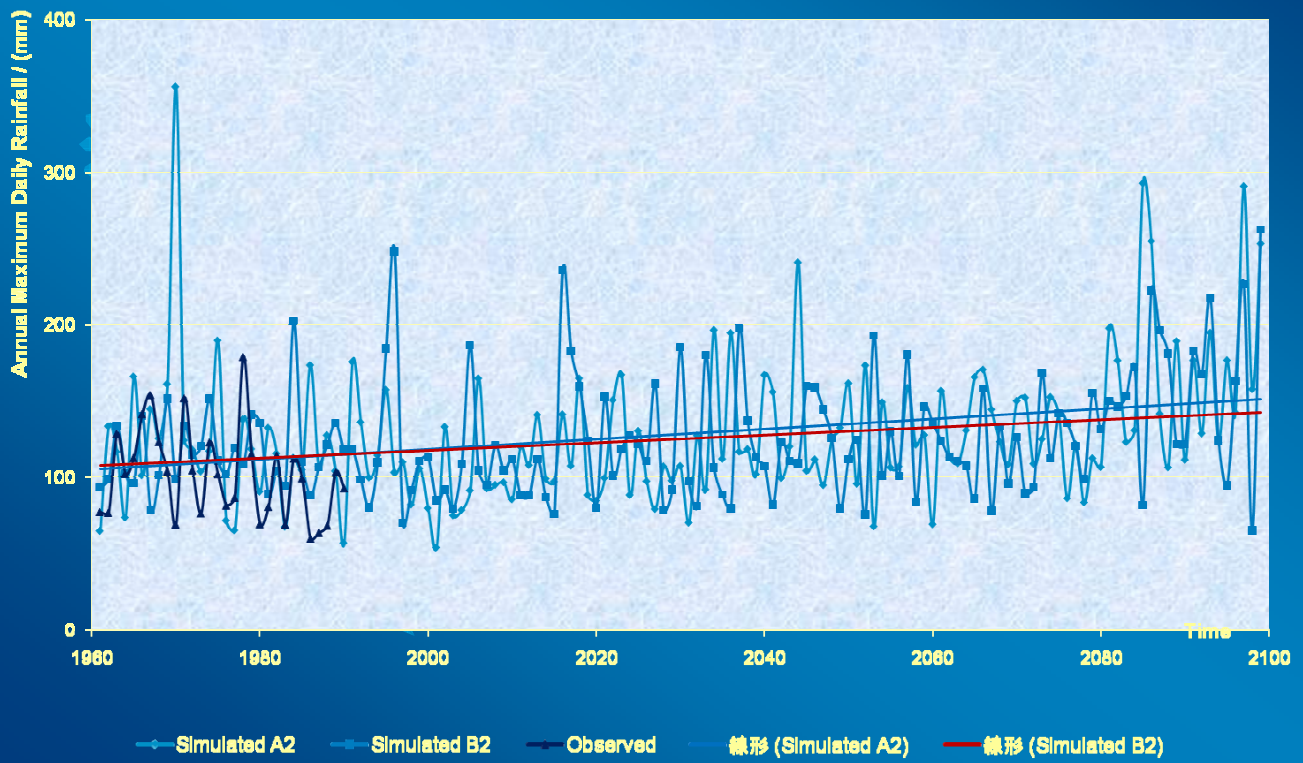


Models Used for Flood Analysis

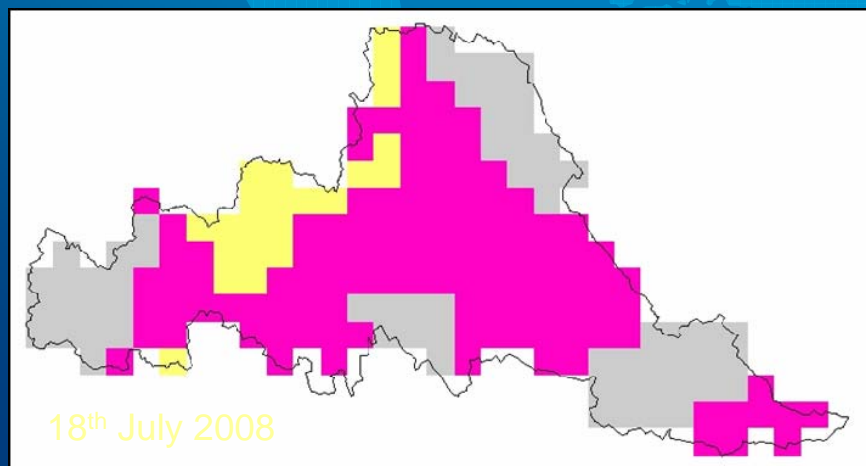
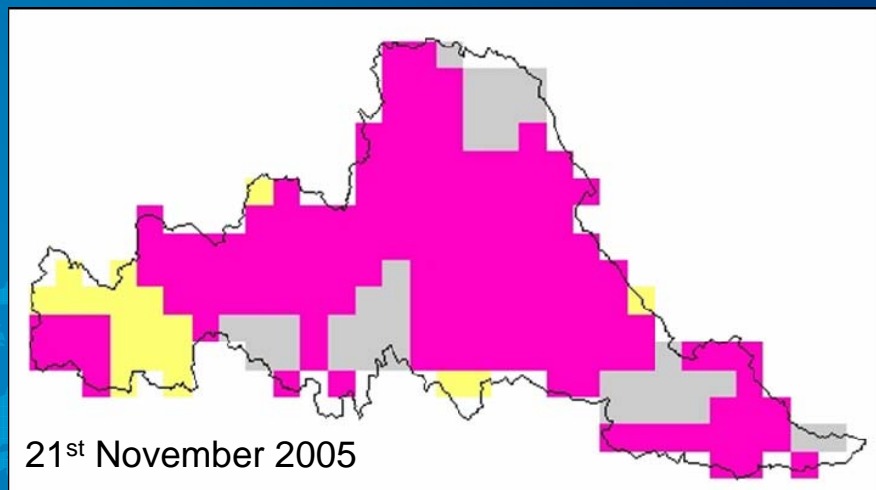
- Weather Research and Forecasting (WRF) Model – For weather forecast (36 hrs ahead)
- Statistical Down Scaling Model (SDSM) – For climate forecast
- SHER Model /HEC-HMS Model – Hydrological model for generate Hanwella flow
- FLO-2D Model – 2D flood model for flood modeling and inundation analysis

SDSM Output

Annual maximum daily precipitation variation over the Kelani catchment



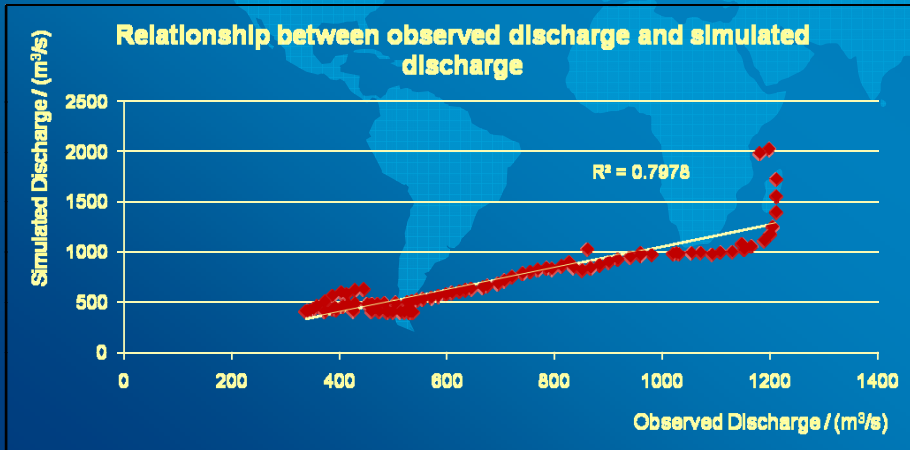
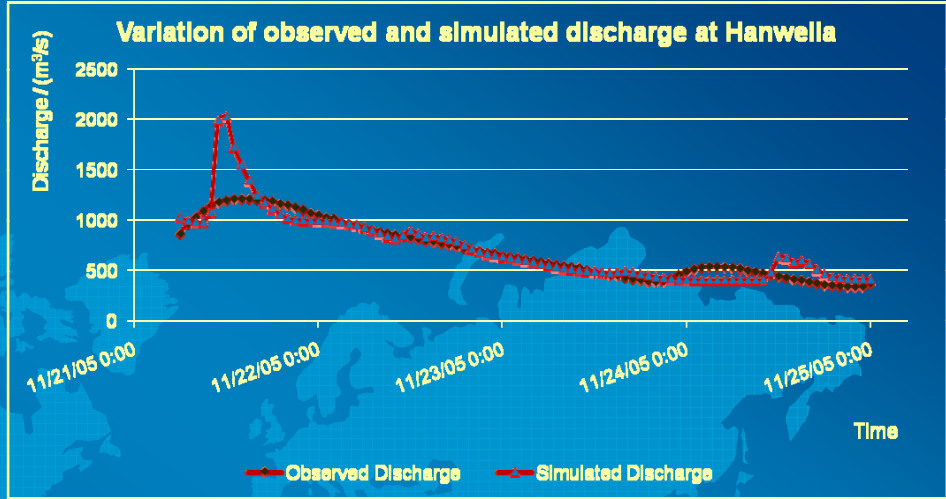
WRF Output



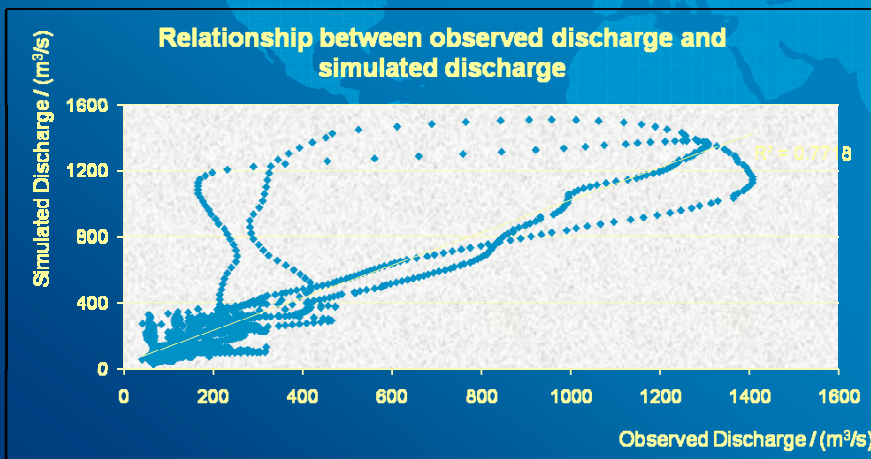
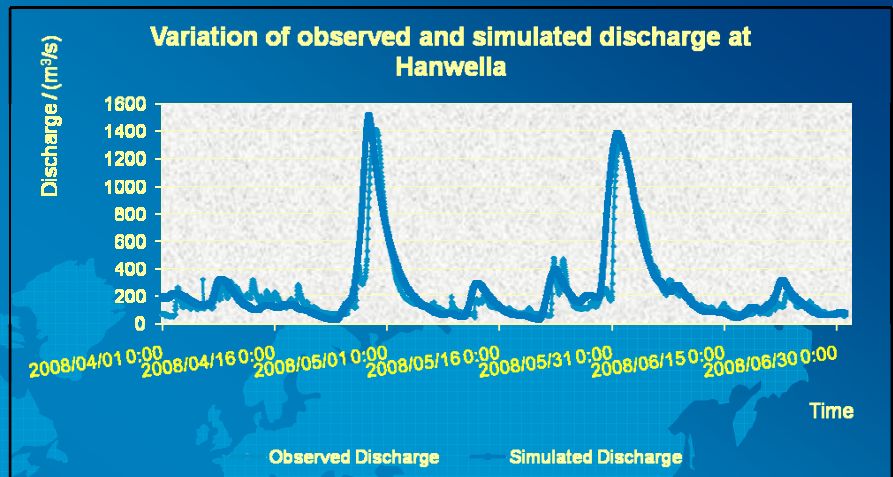
Legend

- Under Prediction
- Over Prediction
- Prediction within +/- 40% of actual rainfall

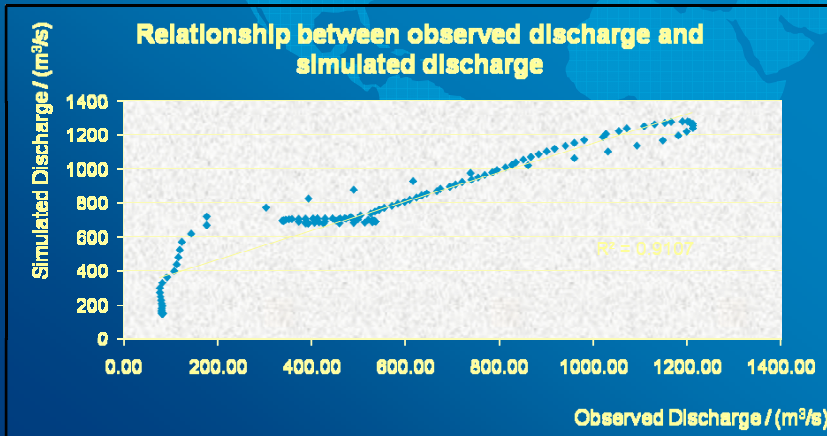
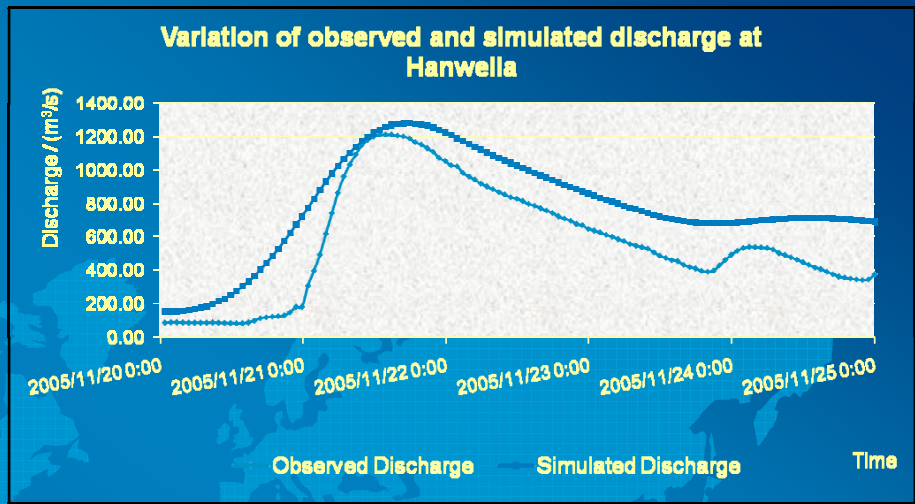
SHER Output



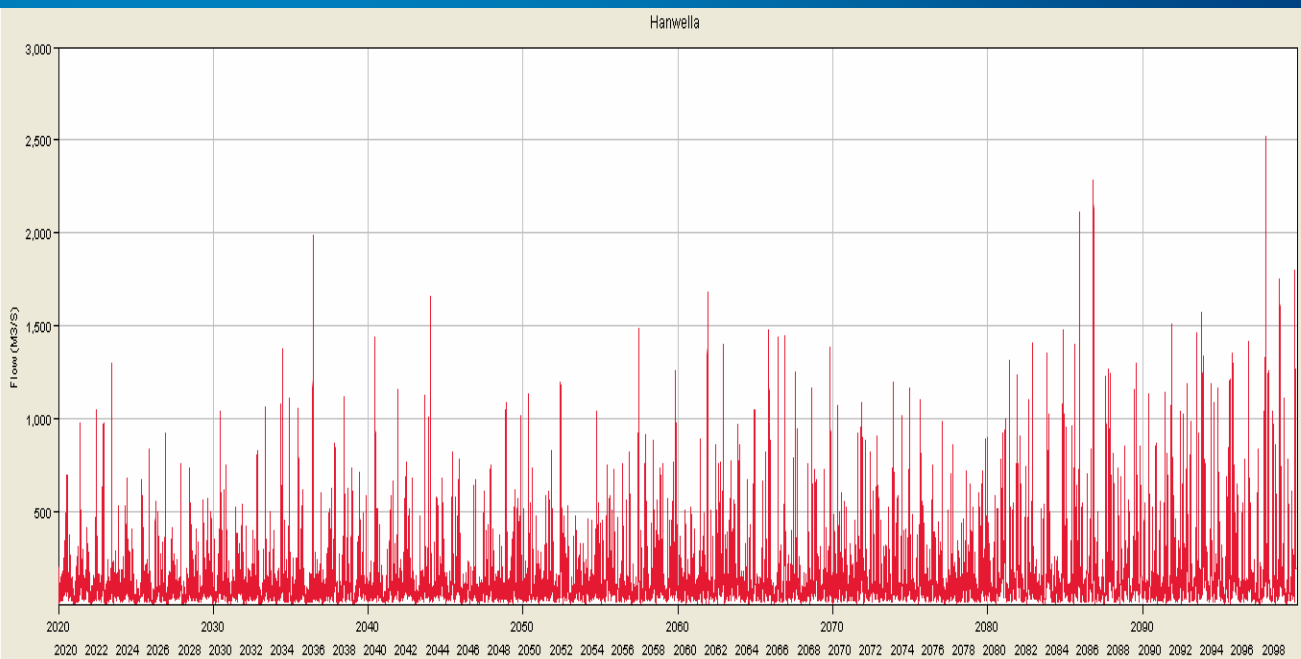
HEC-HMS output for two event



HEC-HMS output for one event

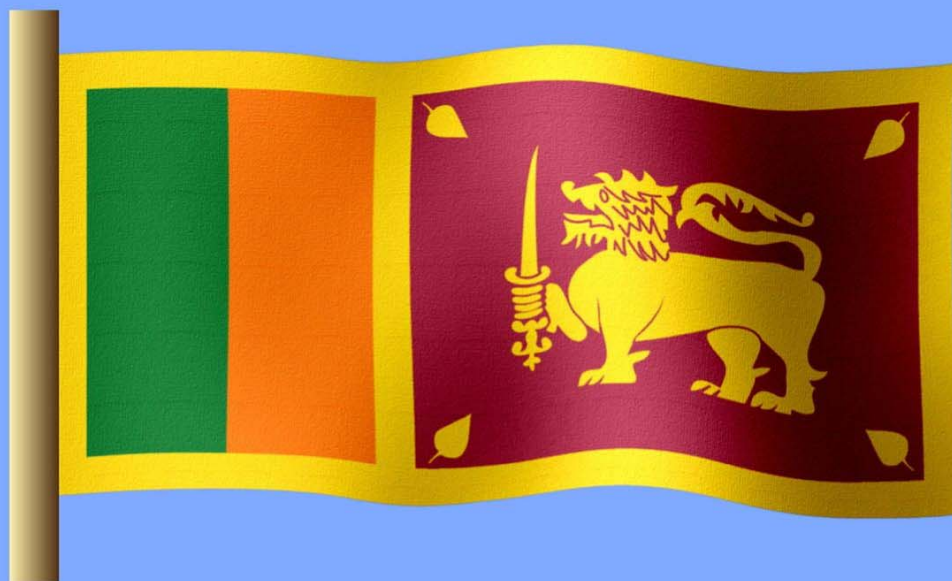


HEC-HMS hourly discharges for SDSM outputs at Hanwella



Proposed Adaptation measures

- Examine the capacity and location of reservoirs and tanks to take advantage of more intense and shorter rain periods
- Construct levees, flood walls and protection structures to minimize flood loss and damage
- Aware people about climate change and extreme conditions while introducing flood warning system
- Mechanisms to stop silting of current tanks by erosion due to heavier rainfall should be investigated
- Rain water harvesting technologies should be promoted





THANK
YOU