There has been an observed deficit in rainfall across Victoria from 1996-2009 which has been investigated in detail as part of the South Eastern Australia Climate Initiative. This deficit led to a very pronounced reduction in the inflow in the water catchments across most of the region. A wet 2010 has restored water levels in many catchments of south eastern Australia apart for the largest reservoirs for which several above average rainfall years are required. Despite record rainfall across most of Australia (such as the entire Murray-Darling Basin) leading to above average run-off for the Murray River and most catchments north of the Great Dividing Range; below average run-off was recorded south of the divide (i.e. Melbourne Water catchment area).

In this study we focus on the rainfall-runoff relationship on both sides of the Great Dividing Range. Two well observed and natural catchments were chosen: the Eildon catchment on the north side of the divide and the Melbourne Water catchments on the south side. First, long-term relationships between rainfall in these two catchments and known modes of variability affecting South Eastern Australia are investigated with a focus on the differences between the two sides of the Divide. Alongside remote tropical influences, we look at how the regional sub-tropical ridge (intensity and position) is affecting the rainfall in these two catchments on inter-annual and decadal time-scales. In addition the role that rising temperature may be playing in the rainfall run-off relationship is investigated on both sides of the Divide.