

Statistical Downscaling Methods (I)

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The presentation provides a four-part introduction to the rationale and basis of statistical downscaling using General Circulation Model (GCM) output. In part one, a chronicle of technical developments is presented, charting the emergence of statistical downscaling from its roots in synoptic climatology and weather pattern classification, through modified weather generator techniques, conditioning by continuous predictor variables, incorporation of slowly varying climate signals, culminating in model sensitivity and intercomparison studies. Part two provides a brief survey of the range of local impact studies that have recently implemented statistical downscaling as a means of generating regional climate change scenarios, identifying levels of commonality and value-added (beyond that of host GCM output). Part three illustrates the degree of skill attained by statistical downscaling under present climate conditions, at both daily and inter-annual time-scales. The legitimacy of applying the same transfer functions to future climate simulation is then considered. Finally, a number of practical concerns and key research opportunities are introduced.