

Coupled regional modelling of atmospheric–hydrologic processes for reconstruction of hydro-climate data and climate change assessment

M. L. KAVVAS¹, Z. Q. CHEN², N. OHARA¹, M. L. ANDERSON², A. J. SHAABAN³ & M. Z. M. AMIN³

¹ *Hydrologic Research Laboratory, Dept of Civil and Environmental Engineering, University of California, Davis, California 95616, USA*
mlkavvas@ucdavis.edu

² *California Dept of Water Resources, 1416 9th St, Sacramento, California 95814, USA*

³ *National Hydraulics Research Institute of Malaysia (NAHRIM), 43300 Seri Kembangan, Selangor, Malaysia*

Abstract We describe the modelling of the Earth system over regions of varying spatial scale as a fully-coupled system of atmospheric processes aloft, coupled with the atmospheric boundary layer, land surface processes, and surface and subsurface hydrological processes. The interactions among the various component processes within the Earth system over a specified region are described, and an approach for modelling these interactions toward reconstruction of sparse hydro-climate data and assessment of climate change is discussed. The application of the resulting Regional Hydro-Climate Model (RegHCM) to several regions around the world is presented.

Key words coupled atmospheric–hydrologic processes; regional hydro-climate model