Supporting Information for

Identifying uncertainties in simulated streamflow from hydrologic model components for climate change impact assessments

Dongmei Feng[1] and Edward Beighley[2,3]

[1]Department of Civil and Environmental Engineering, University of Massachusetts, Amherst, MA

[2]Department of Civil and Environmental Engineering, Northeastern University, Boston, MA

[3] Marine and Environmental Sciences, Northeastern University, Boston, MA

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Introduction

Figure S1 shows the conceptual framework of the model used in this paper. Figures S2-S4 show additional results corresponding to Figure 4 in the main manuscript.

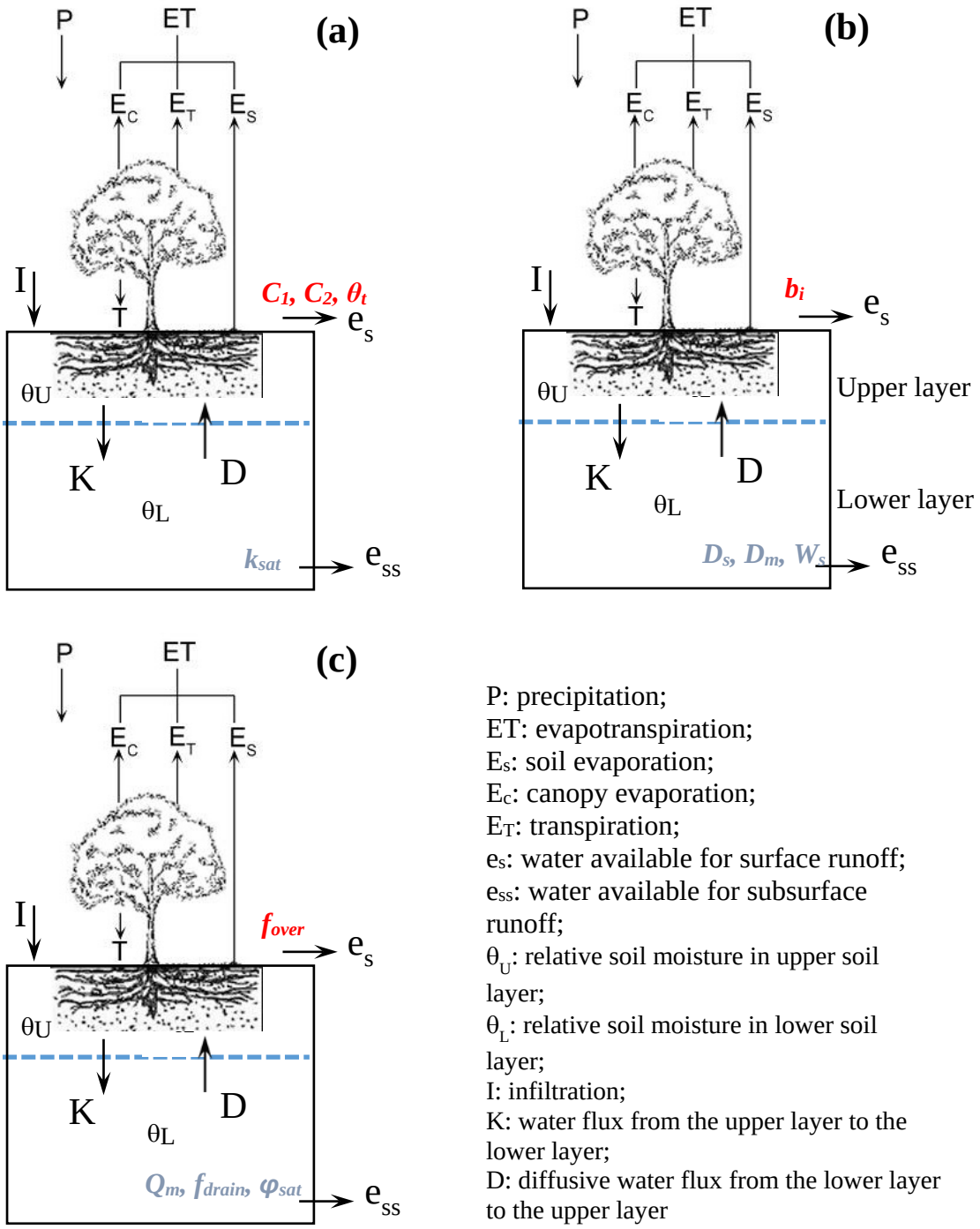

Figure S1. The conceptual framework about the definition of soil matrix for infiltration and runoff generation processes; this figure is adapted based on the work of Beighley et al. (2009). (**a**) shows parameters for Runoff Coefficient Method (RCM); (**b**) shows parameters for Variable Infiltration Capacity (VIC); and (**c**) shows parameters for Simple-TopMODEL (STP). The parameters in red italic are for surface runoff generation, and parameters in blue italic are for subsurface runoff generation. The definition of these parameters can be found in Method section.

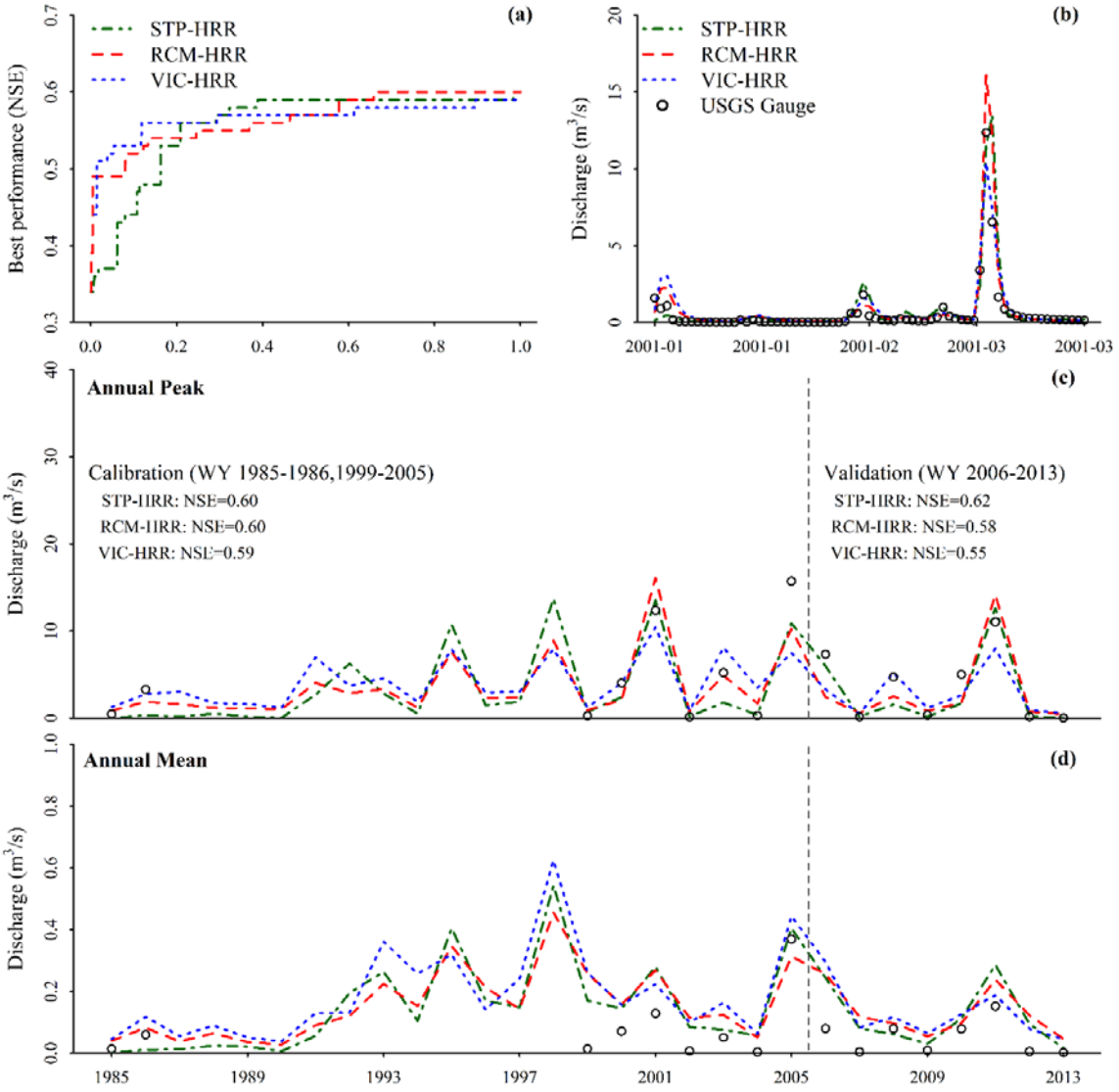

Figure S2. Model performance for calibration and validation periods: (**a**) model performance (represented by NSE) during calibration process, x axis is the normalized calibration progress; (**b**) hydrographs simulated by 3 calibrated models and in situ measurements from USGS gauge; (**c**) simulated annual peak flow during calibration (water year 1985-1986, 1999-2005) and validation (water year 2006-2013) periods as compared with in situ observation; texts indicate model performance (i.e., NSE) in reproducing historical hydrographs for both periods; and (**d**) simulated and observed annual mean flow during calibration and validation periods. These results are for Mission Creek watershed (USGS gauge NO. 11119745).

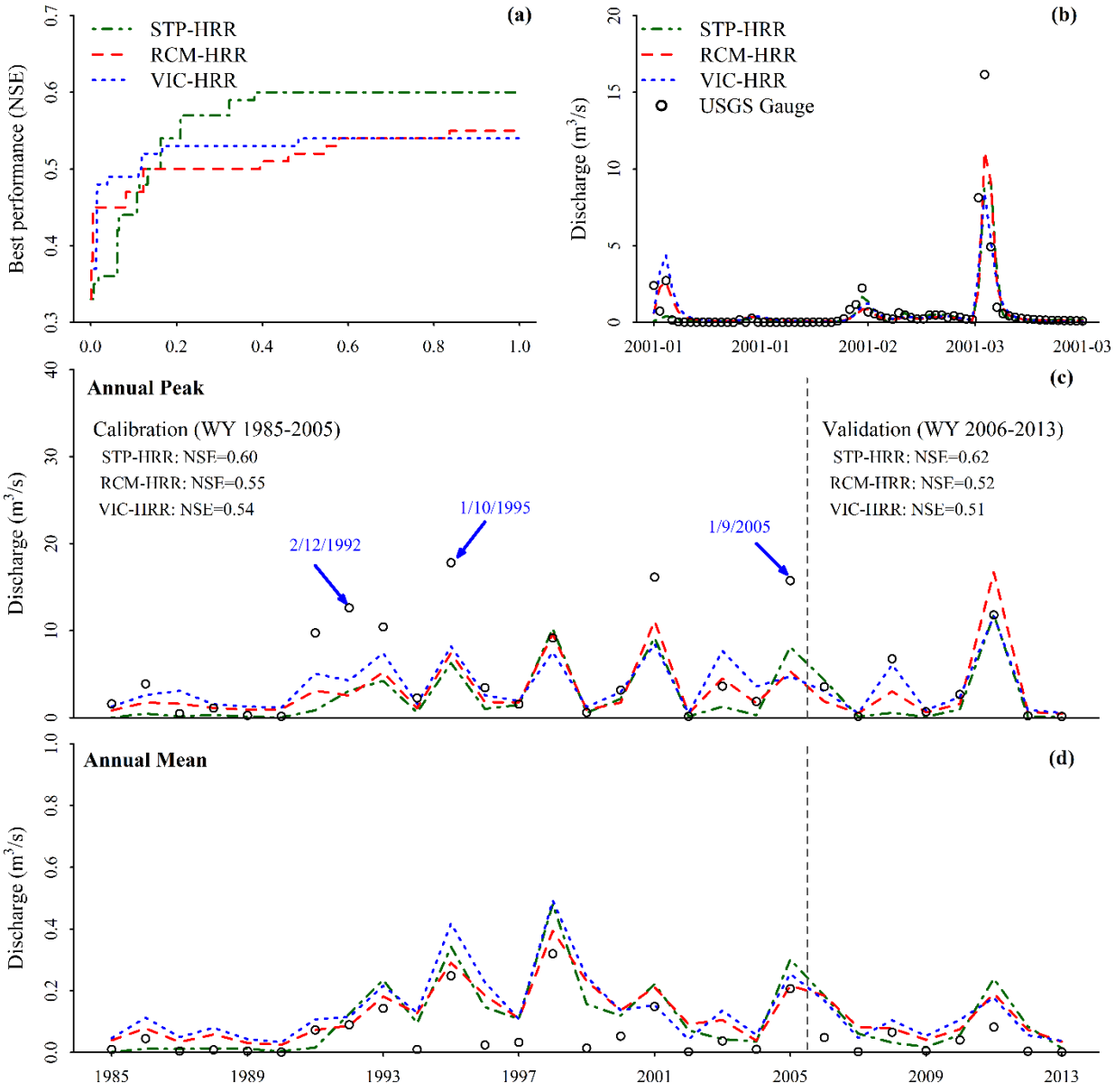

Figure S3. Model performance for calibration and validation periods: (**a**) model performance (represented by NSE) during calibration process, x axis is the normalized calibration progress; (**b**) hydrographs simulated by 3 calibrated models and in situ measurements from USGS gauge; (**c**) simulated annual peak flow during calibration (water year 1985-2005) and validation (water year 2006-2013) periods as compared with in situ observation; texts indicate model performance (i.e., NSE) in reproducing historical hydrographs for both periods; the points highlighted in blue arrows indicate the events which were not reproduced by models probably due to the input (i.e., precipitation) bias; and (**d**) simulated and observed annual mean flow during calibration and validation periods. These results are for Maria Ygnacio Creek at Goleta (USGS gauge NO. 11119940).

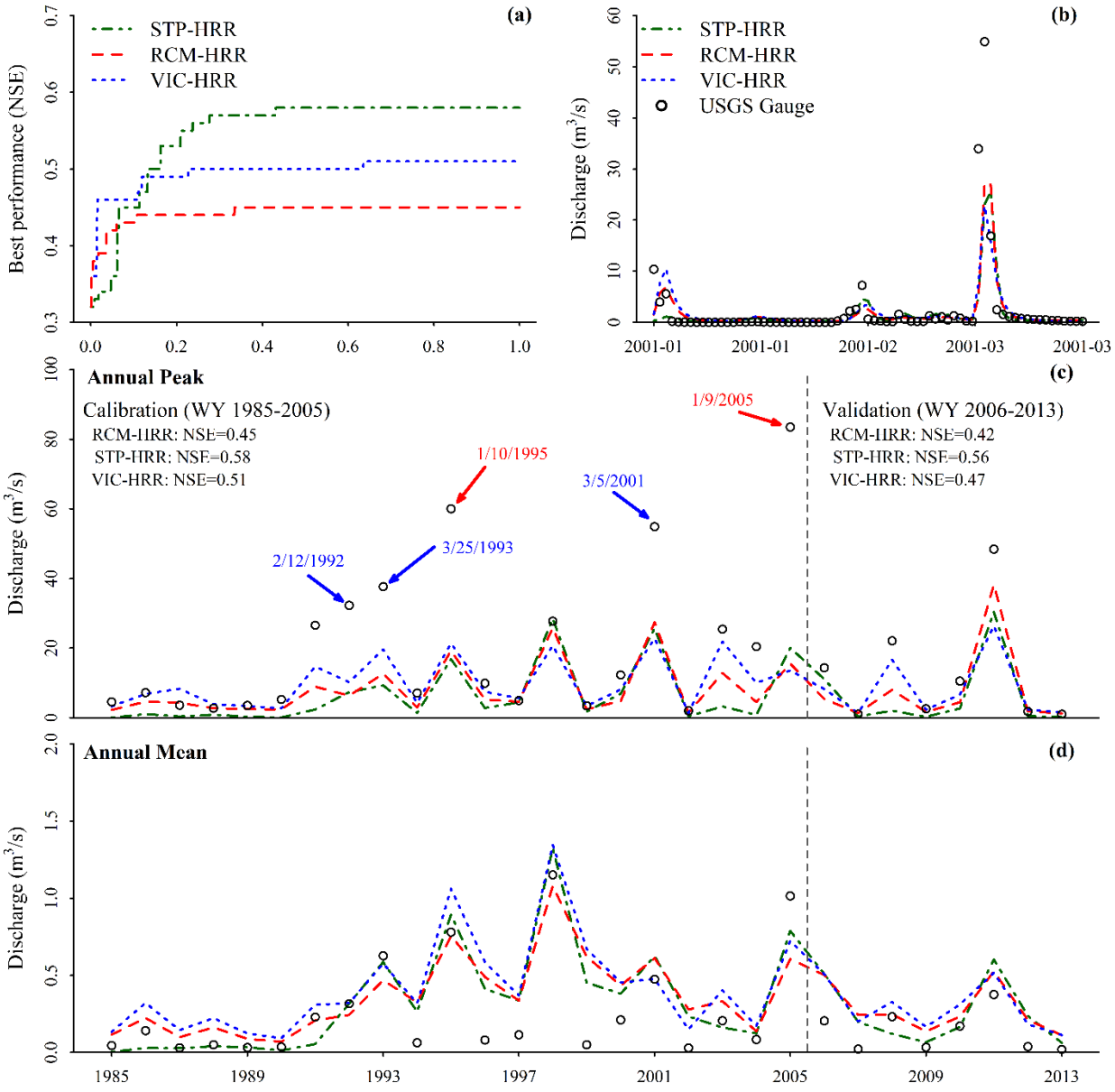

Figure S4. Model performance for calibration and validation periods: (**a**) model performance (represented by NSE) during calibration process, x axis is the normalized calibration progress; (**b**) hydrographs simulated by 3 calibrated models and in situ measurements from USGS gauge; (**c**) simulated annual peak flow during calibration (water year 1985-2005) and validation (water year 2006-2013) periods as compared with in situ observation; texts indicate model performance (i.e., NSE) in reproducing historical hydrographs for both periods; the points highlighted in red arrows indicate the events which were not reproduced by models due to the input (i.e., precipitation) bias; the points highlighted in blue arrow are similar to those in red but at a lower probability; and (**d**) simulated and observed annual mean flow during calibration and validation periods. These results are for Atascadero Creek at Goleta (USGS gauge NO. 11120000).