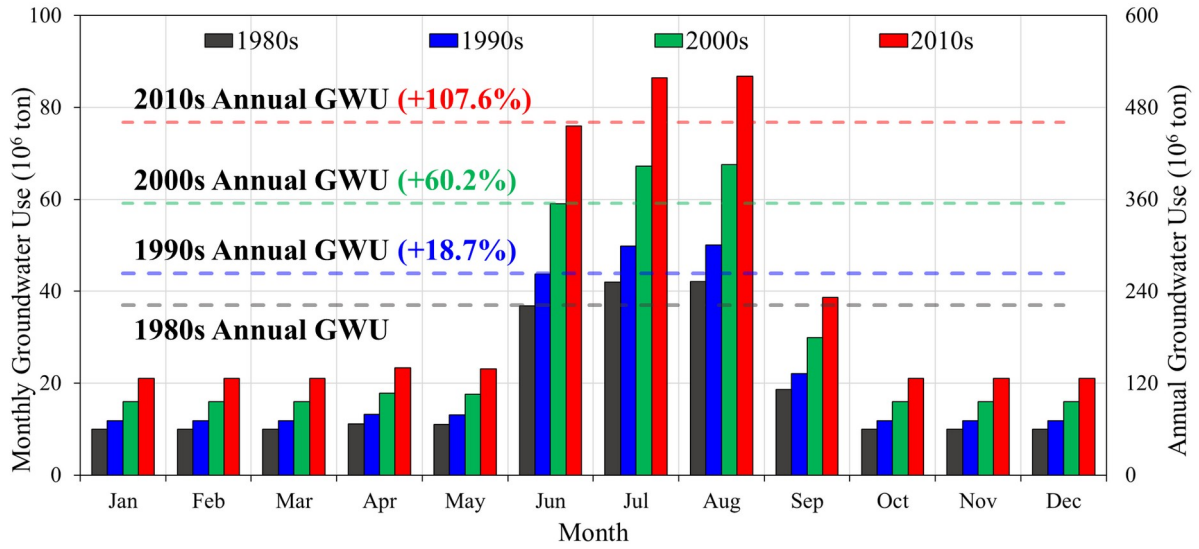


1

2 Figure 1. Spatial information of the study area including (a) the location of hydraulic  
3 structures, (b) digital elevation map, (c) land use, and (d) soil texture.

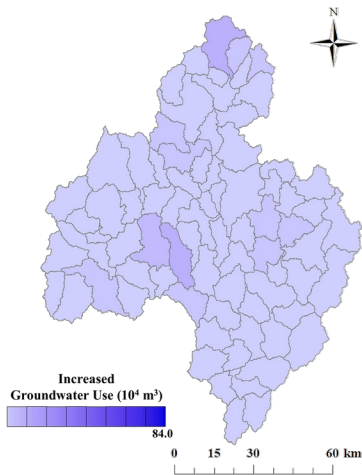
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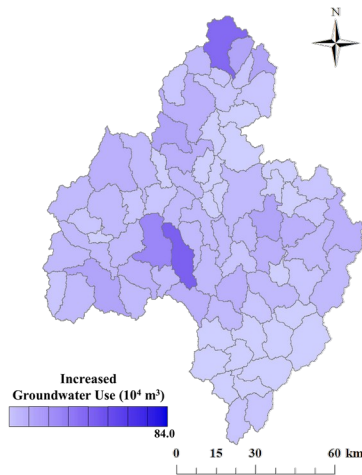
5

6 Figure 2. The illustration of monthly and annual groundwater use data of the Geum River basin  
 7 corresponding to the four decades.

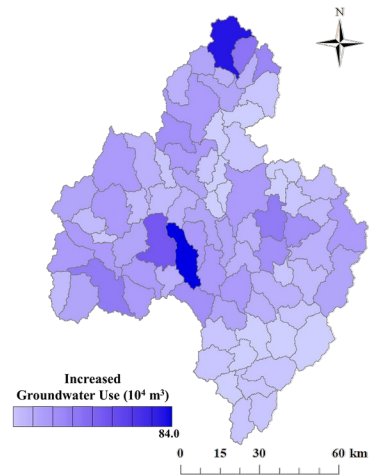
(a) The 1990s



(b) The 2000s



(c) The 2010s

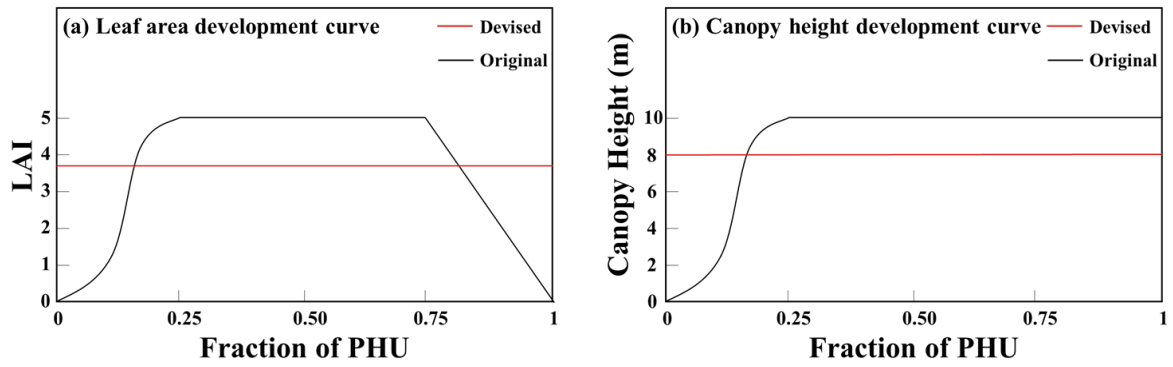


8

9 Figure 3. The spatial increment of groundwater usage in (a) the 1990s, (b) the 2000s, and (c)  
10 the 2010s compared with the 1980s

11

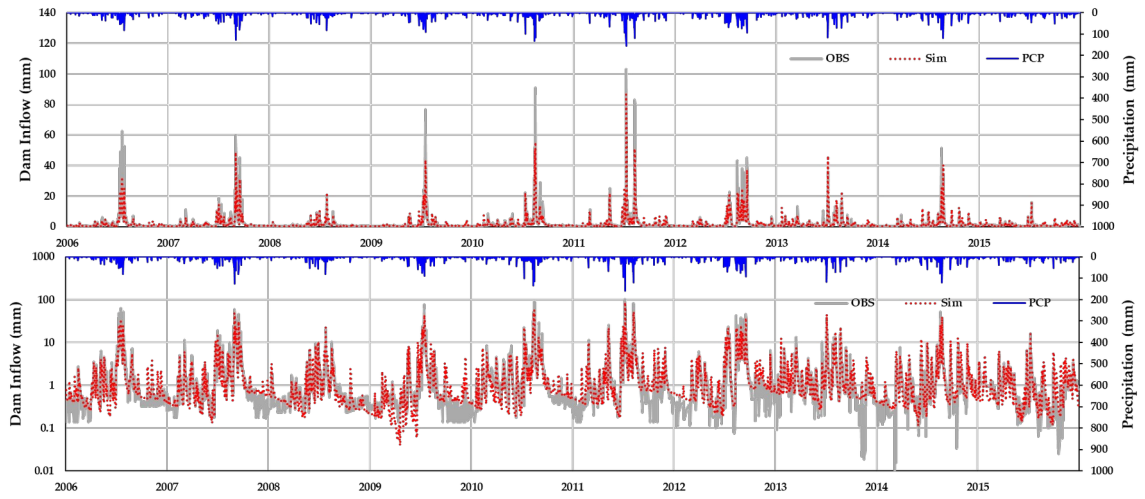
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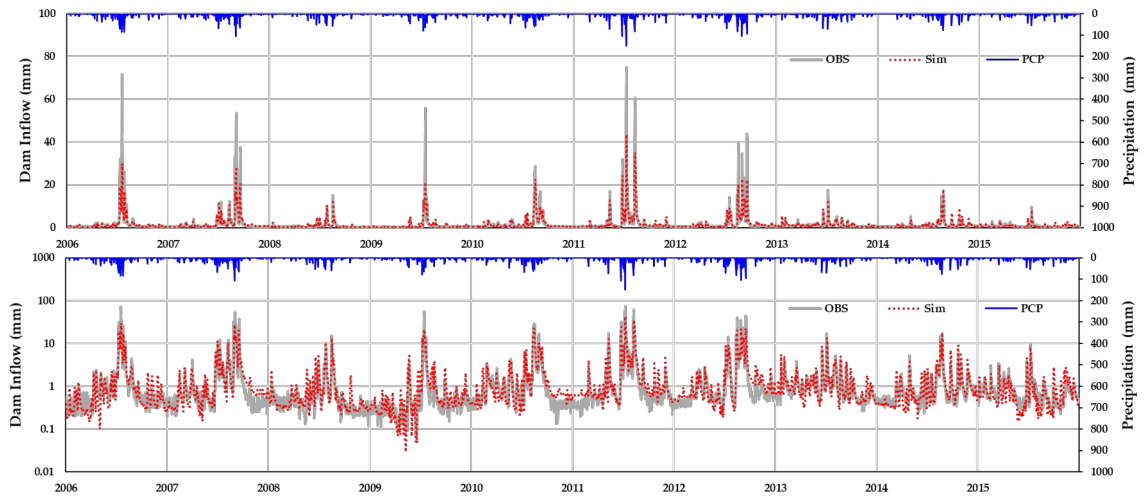
13

14 Figure 4. The visualization of the original and devised development curve of (a) LAI and (b)  
15 canopy height.

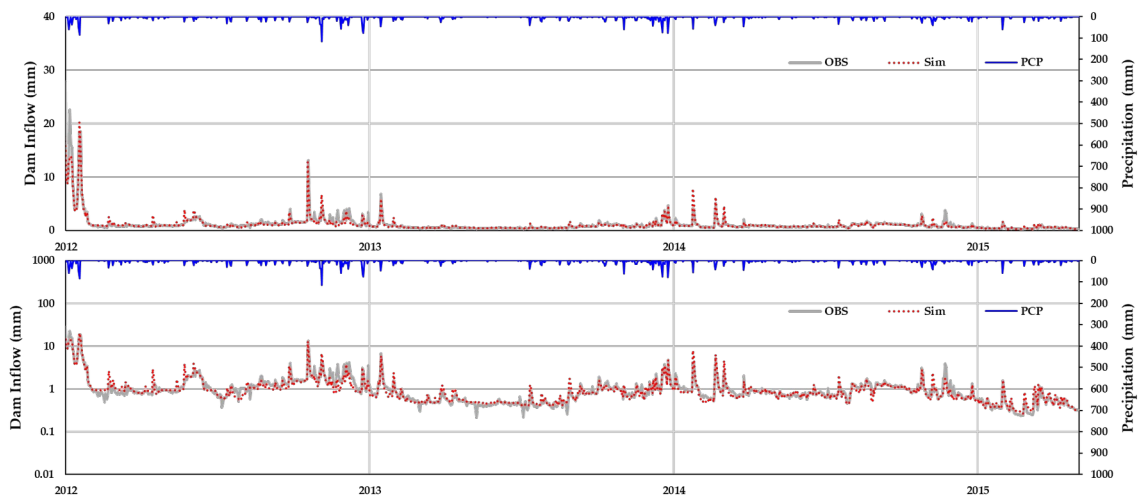
16



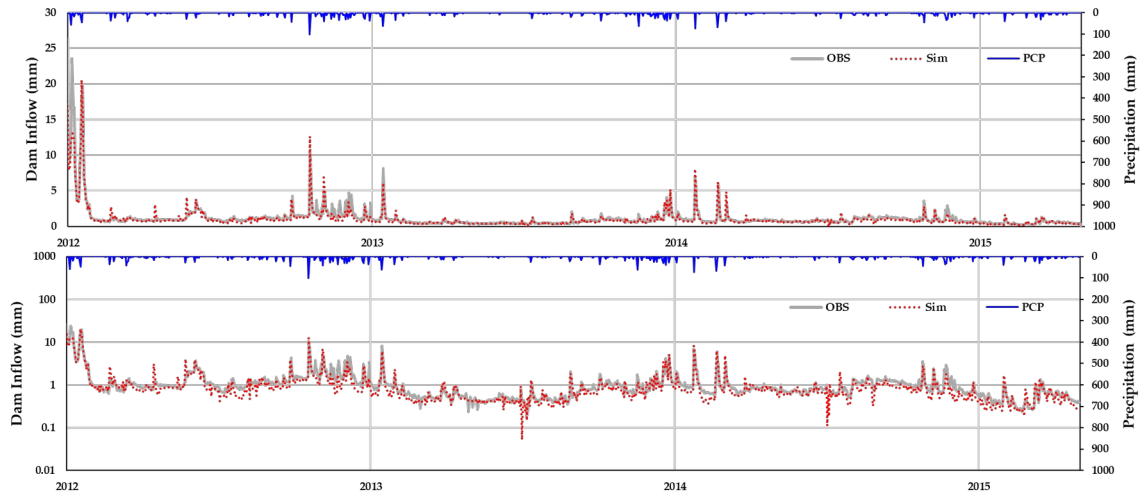
(a) Yongdam Dam (YDD)



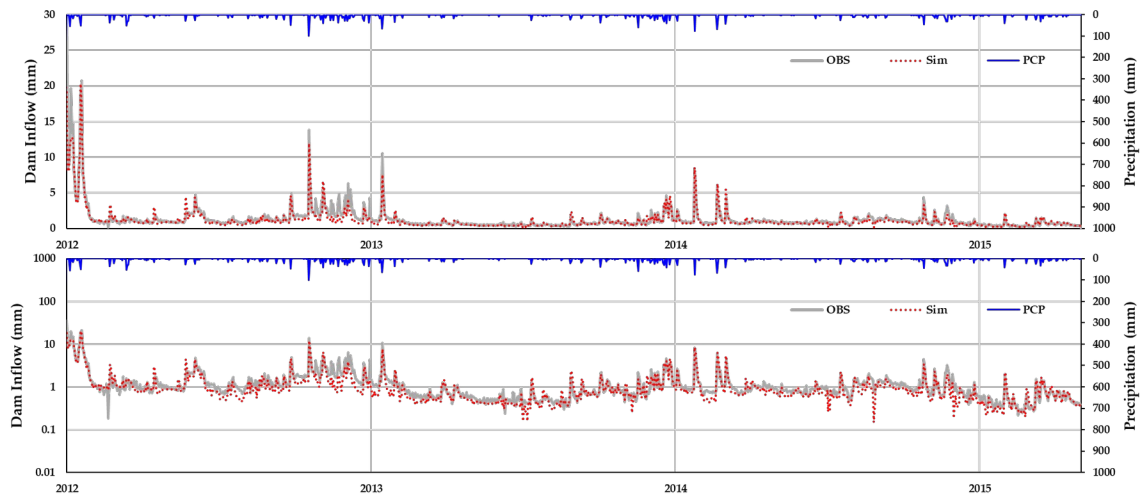
(b) Daechong Dam (DCD)



(c) Sejong Weir (SJW)



(d) Gongju Weir (GJW)



(e) Baekjae Weir (BJW)

Figure 5. The graphical comparison between observed and simulated inflow at (a) YDD, (b) DCD, (c) SJW, (d) GJW, and (e) BJW.

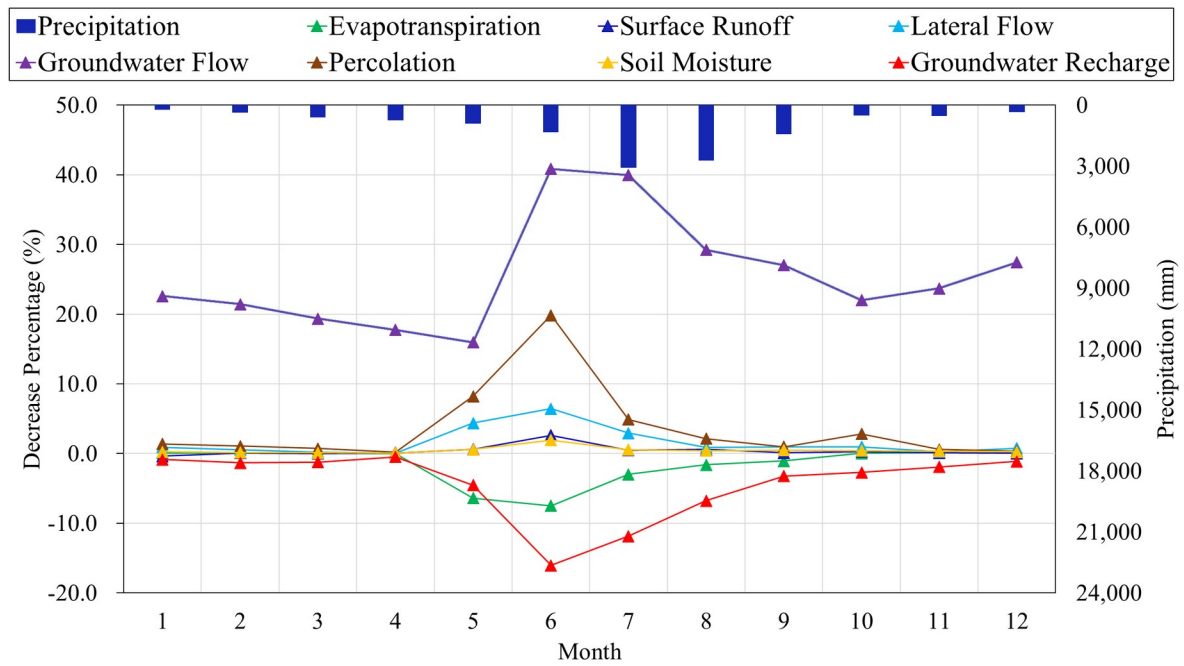
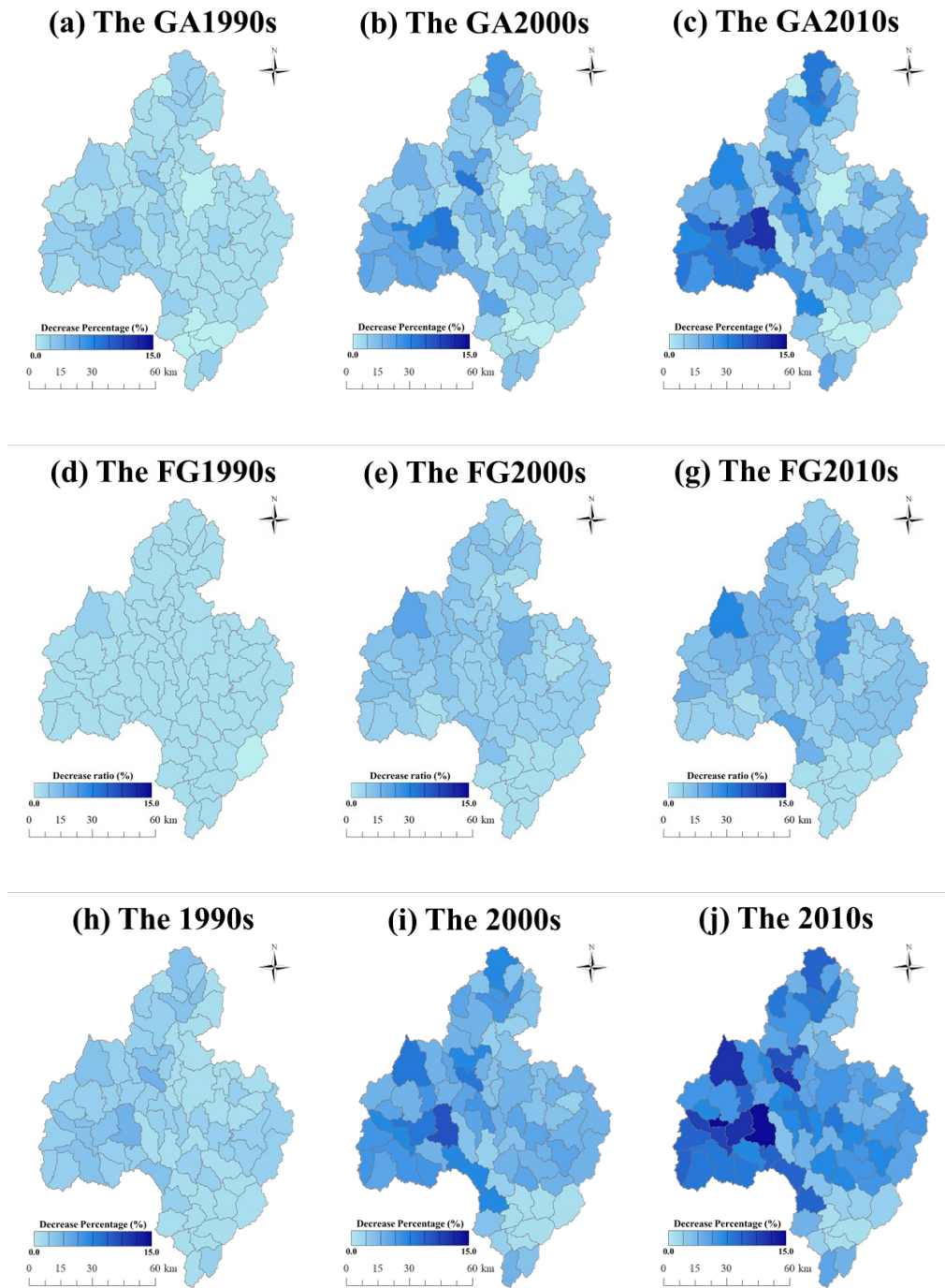


Figure 6. Monthly hydrologic response in the 2010s compared with the 1980s.





33

34 Figure 7. The spatial vulnerability of TR loss caused by GA and FG in (a) the GA1990s, (b)  
 35 the GA2000s, (c) the GA2010s, (d) the FG1990s, (e) the FG2000s, (f) the FG2010s, (g) the  
 36 1990s, (h) the 2000s, and (i) the 2010s.