Supplements for Enhancing physically based and distributed hydrological model calibration through internal state variable constraints

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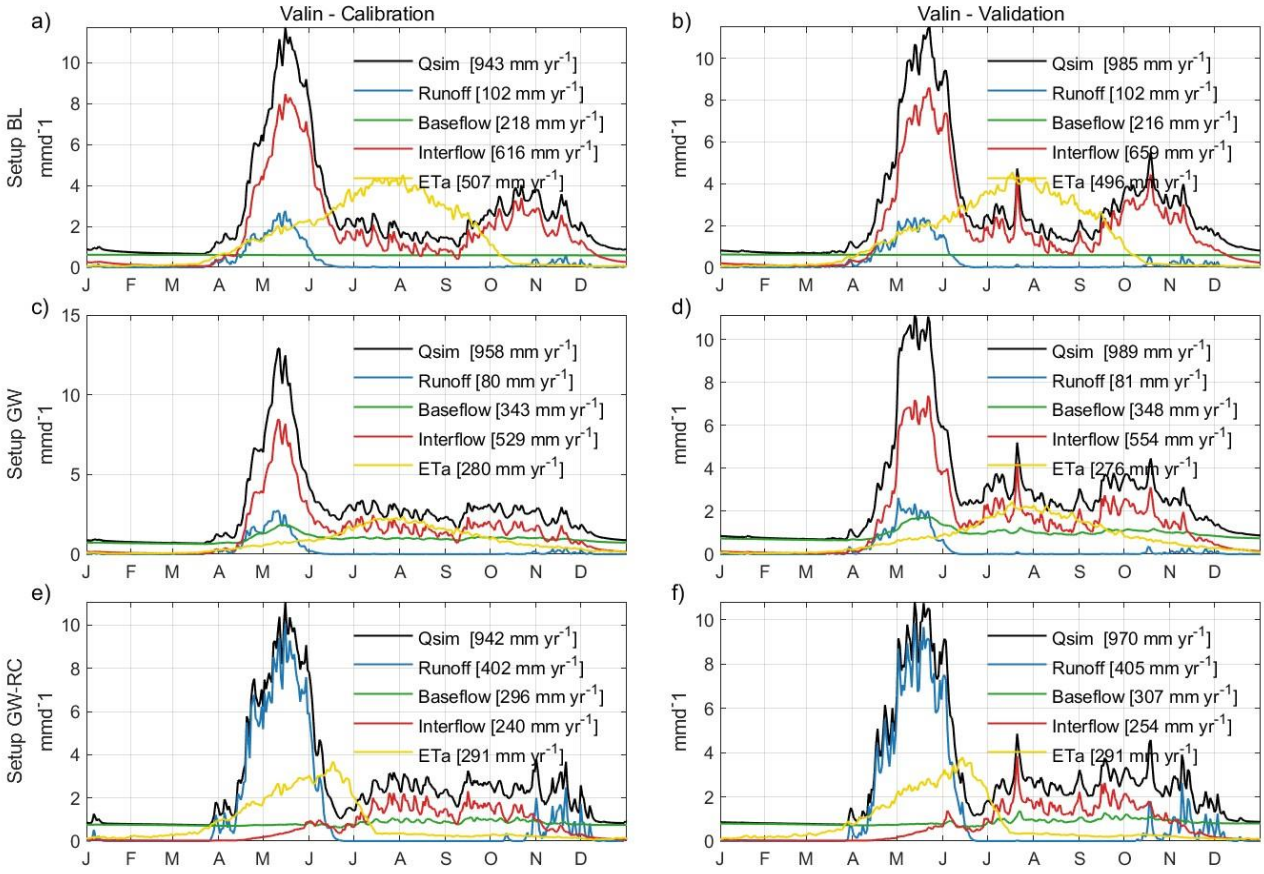

Figure S1. Detailed hydrological variable hydrograph for Valin catchment during both the calibration and validation phases and for the three configurations. Calibration results are shown in panels (a), (c), and (e) for Configurations BL, GW, and GW-RC, respectively, while validation results are depicted in panels (b), (d), and (f). These hydrographs demonstrate how

baseflow, interflow and runoff contribute to total streamflow throughout the year, with noted annual totals provided for a comprehensive comparison.

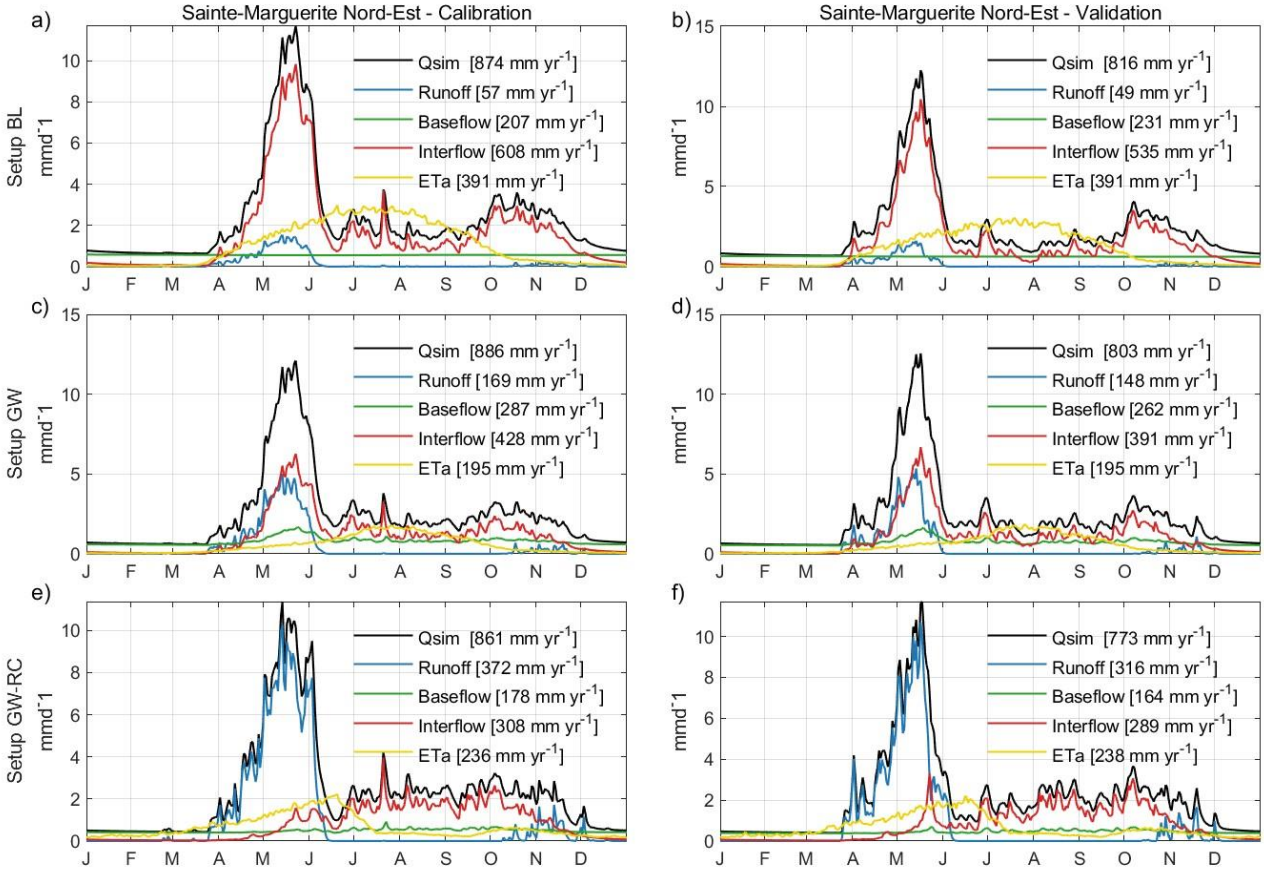

Figure S2. Same as Fig. S1, but for Sainte-Marguerite Nord-Est catchment.

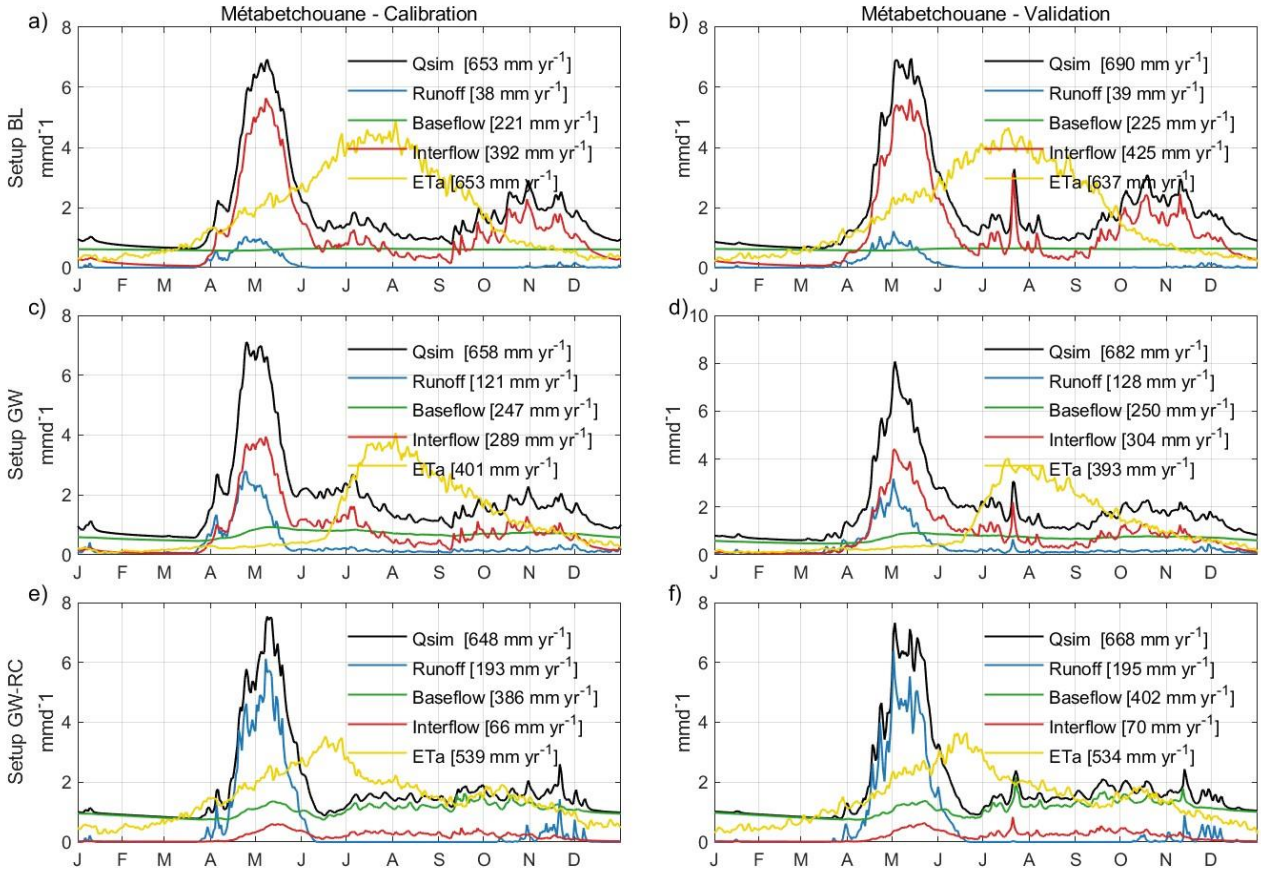

Figure S3. Same as Fig. S1, but for Métabetchouane catchment.

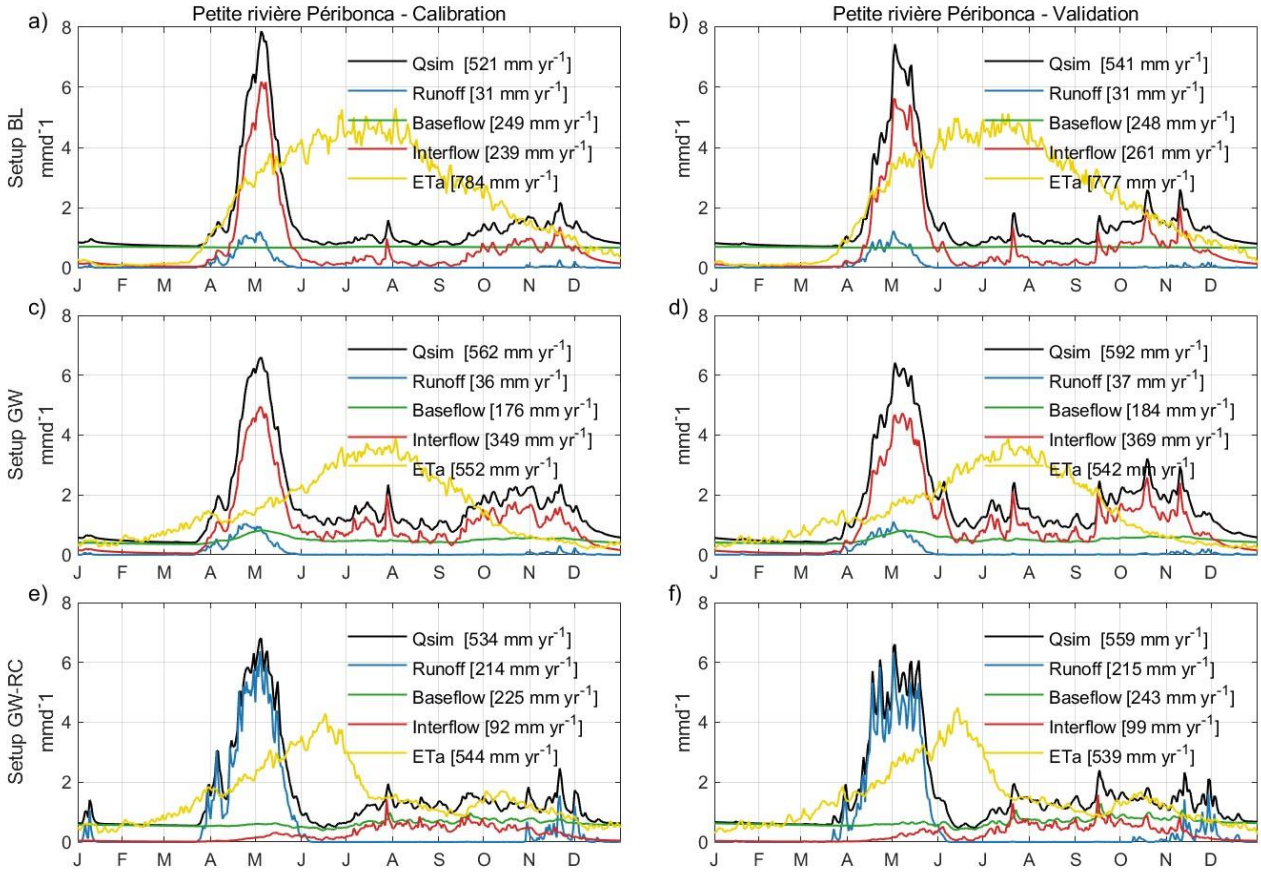

Figure S4. Same as Fig. S1, but for Petite rivière Péribonca catchment.

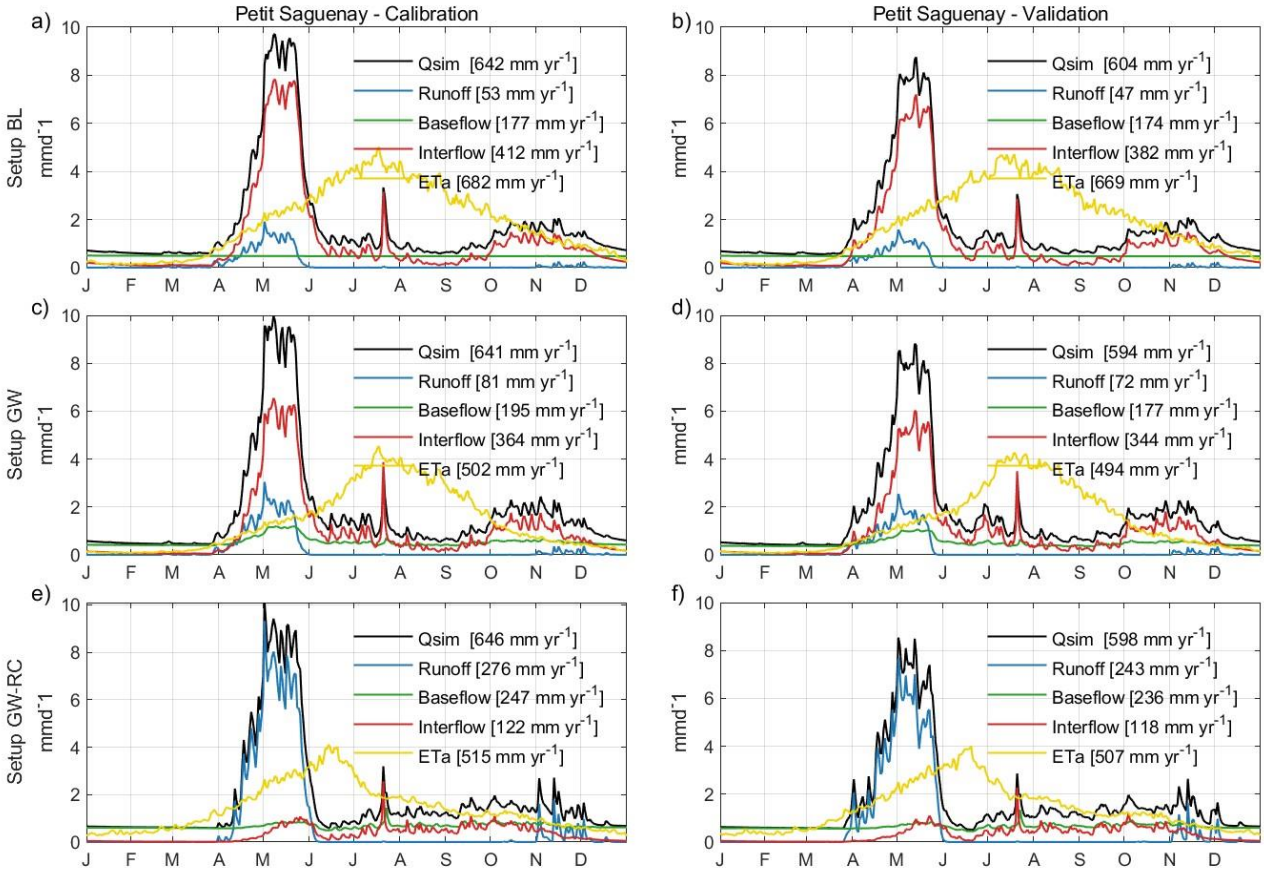

Figure S5. Same as Fig. S1, but for Petit Saguenay catchment.

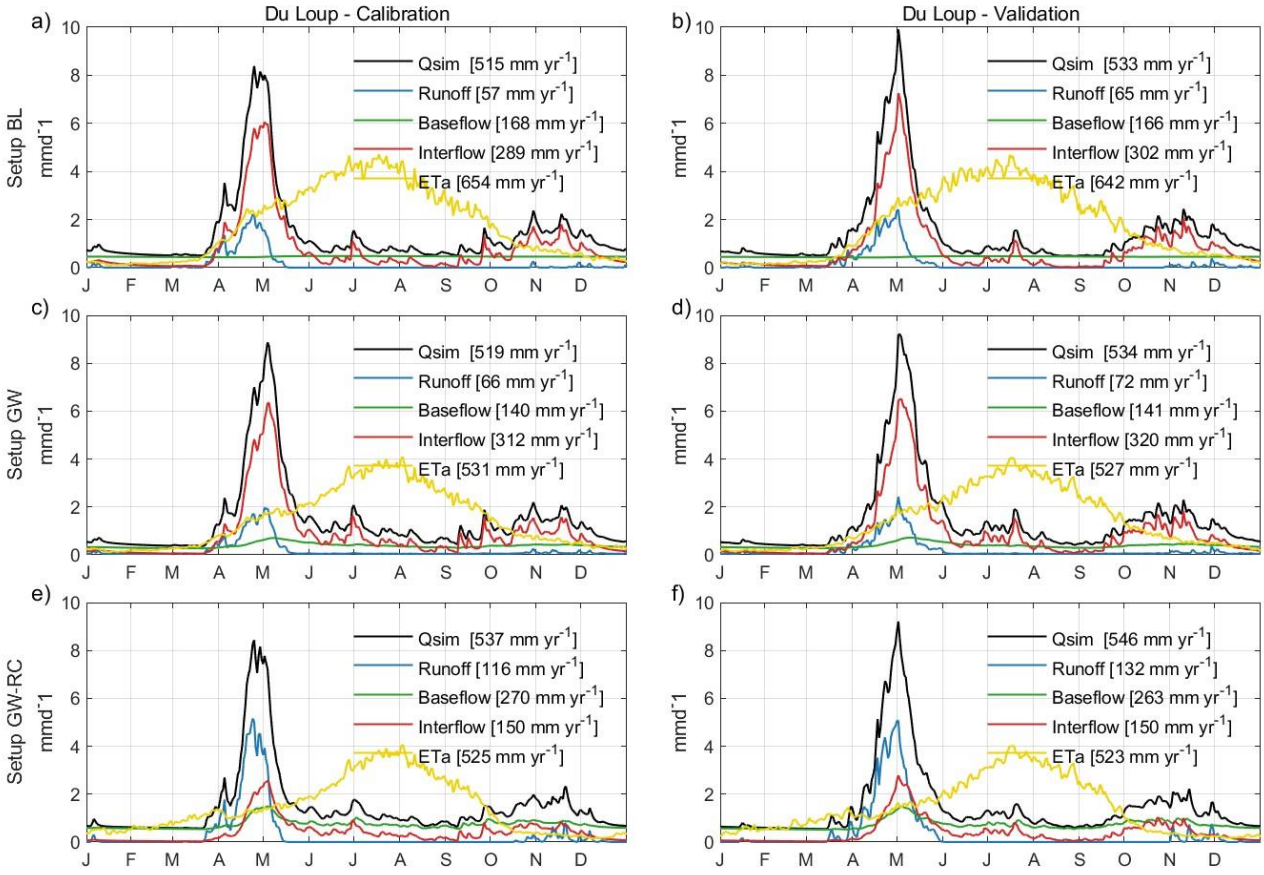

Figure S6. Same as Fig. S1, but for Du Loup catchment.

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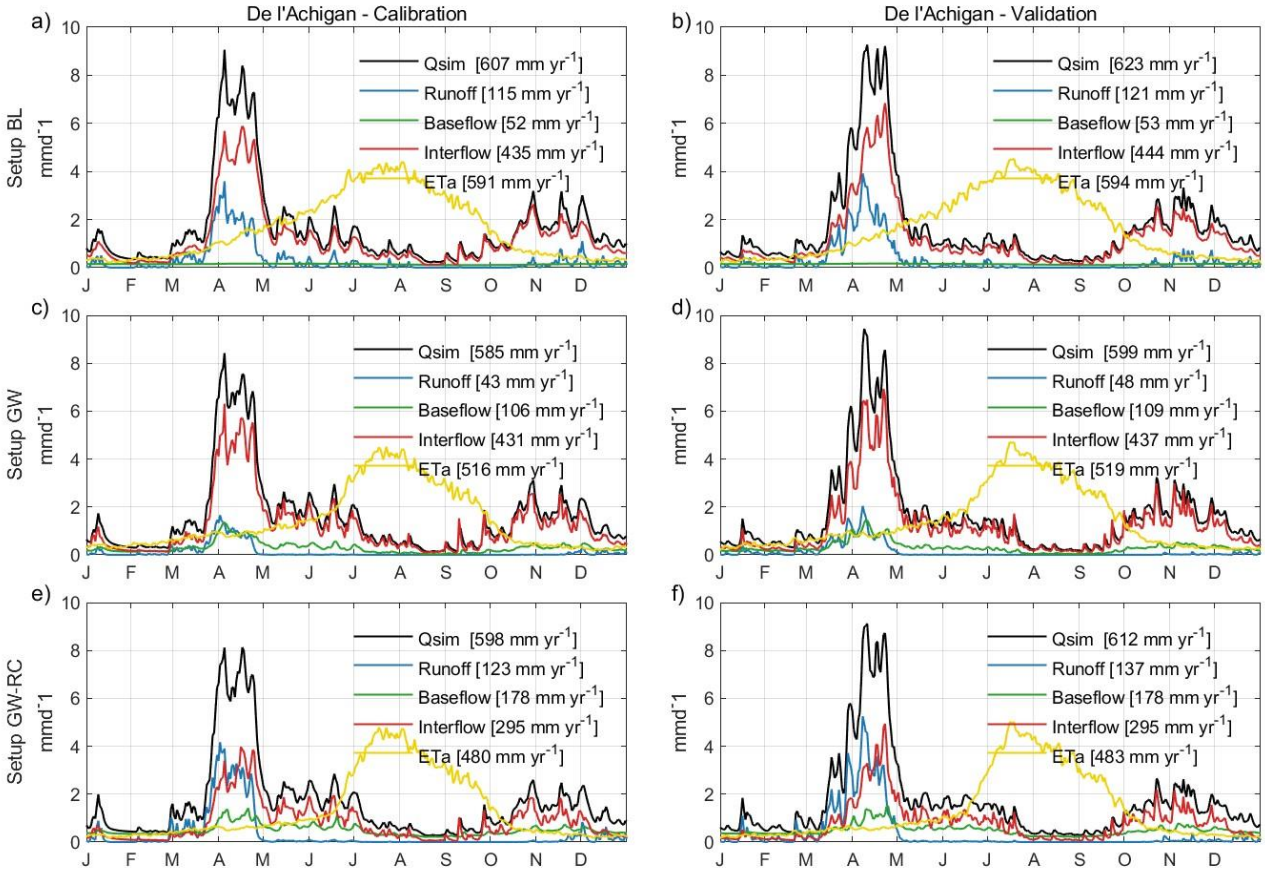
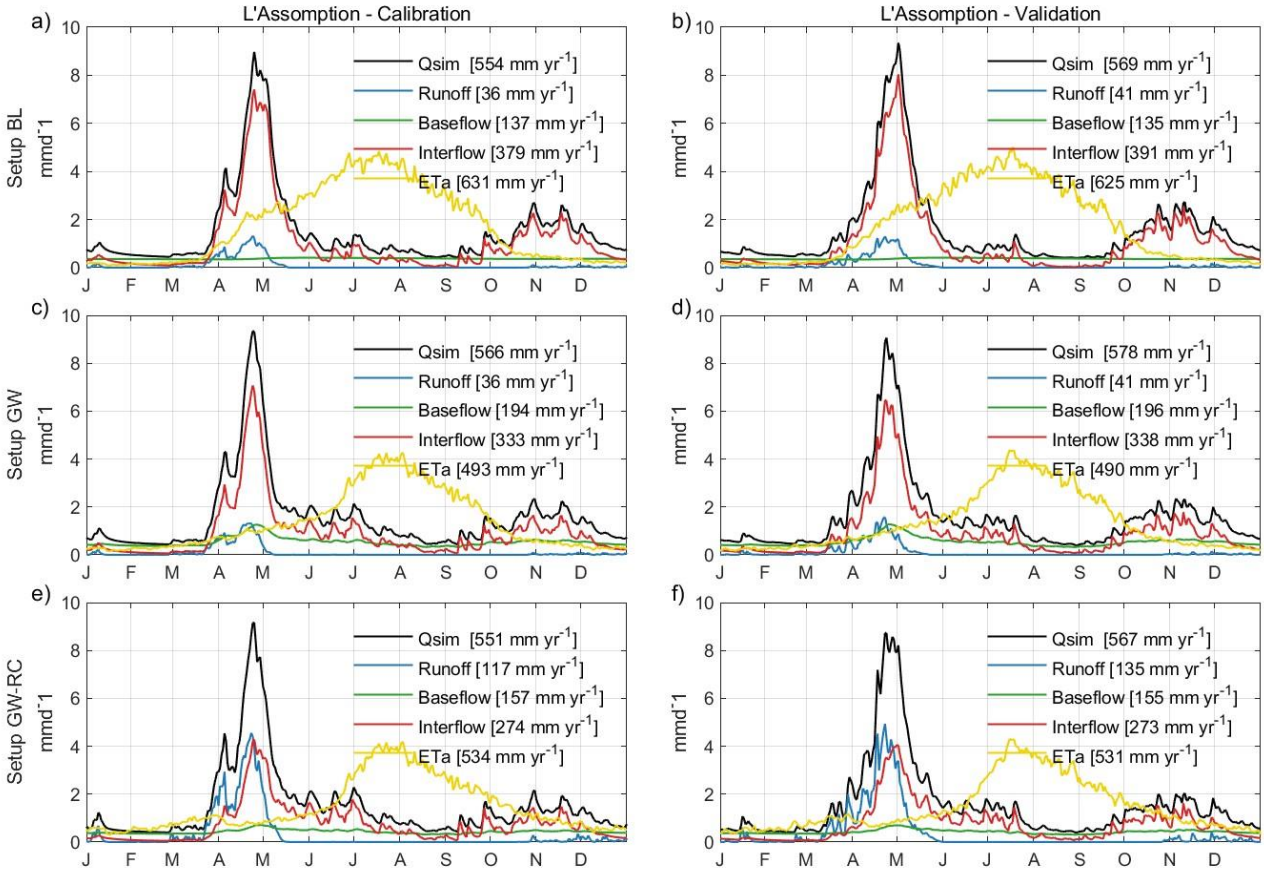


Figure S7. Same as Fig. S1, but for De l'Achigan catchment.



35 Figure S8. Same as Fig. S1, but for l'Assomption catchment.

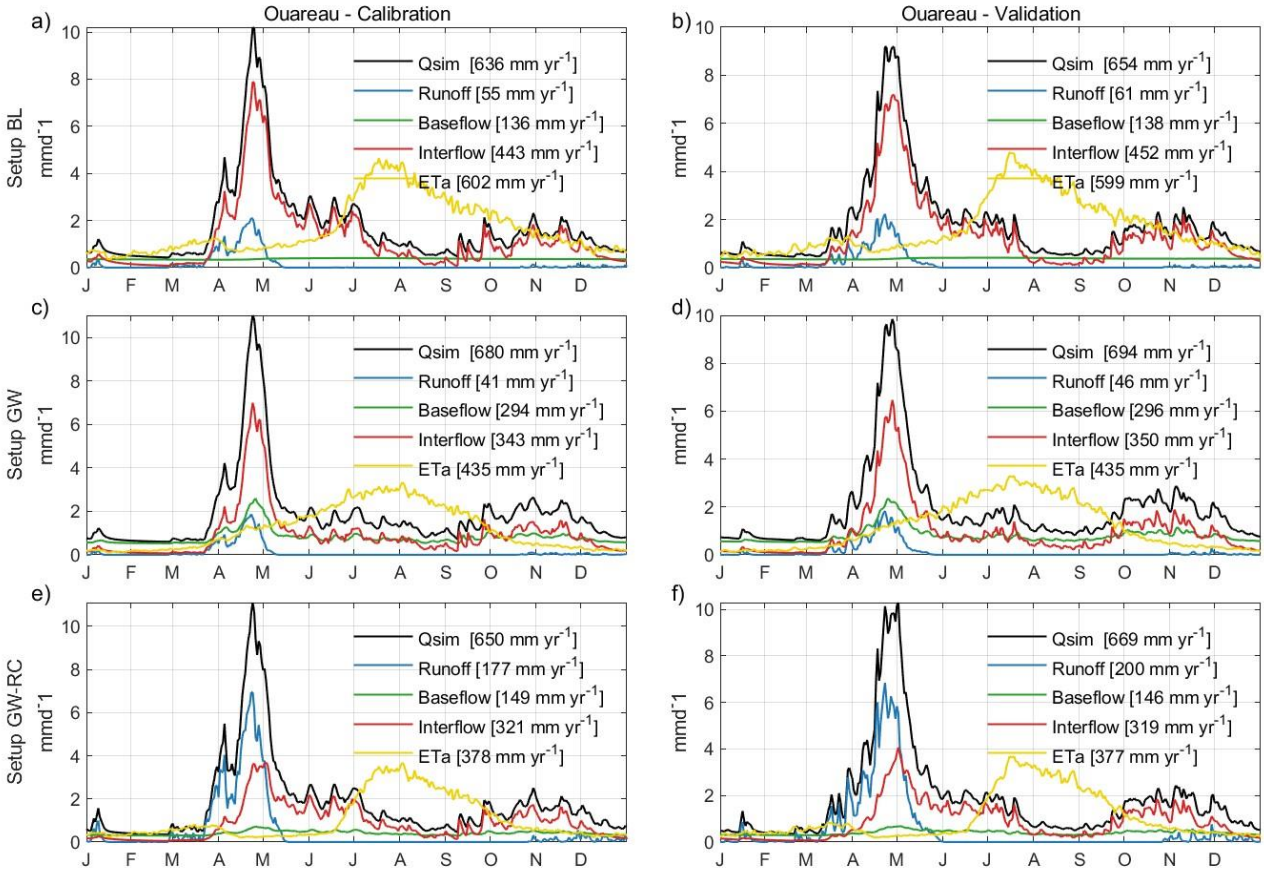


Figure S9. Same as Fig. S1, but for Ouareau catchment.

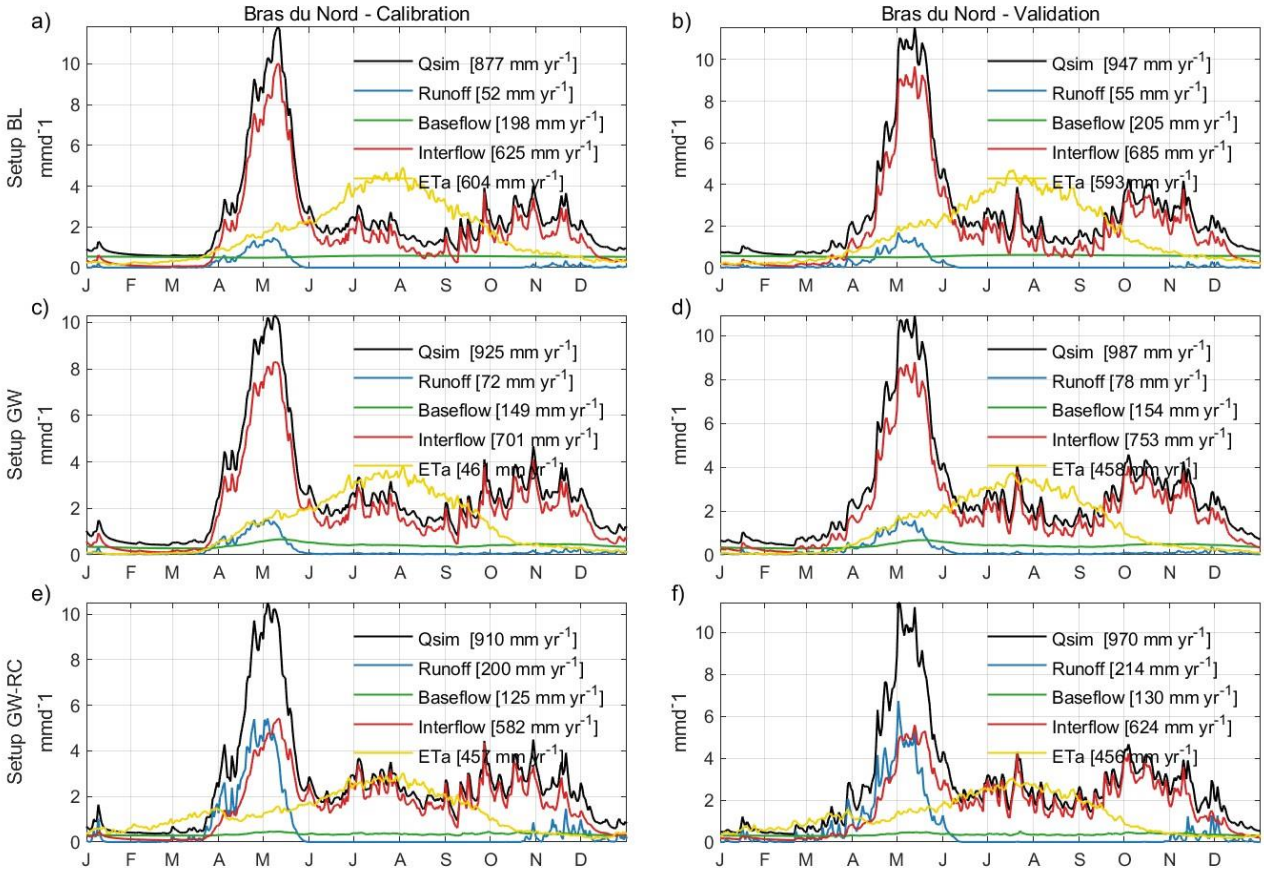


Figure S10. Same as Fig. S1, but for Bras du Nord catchment.

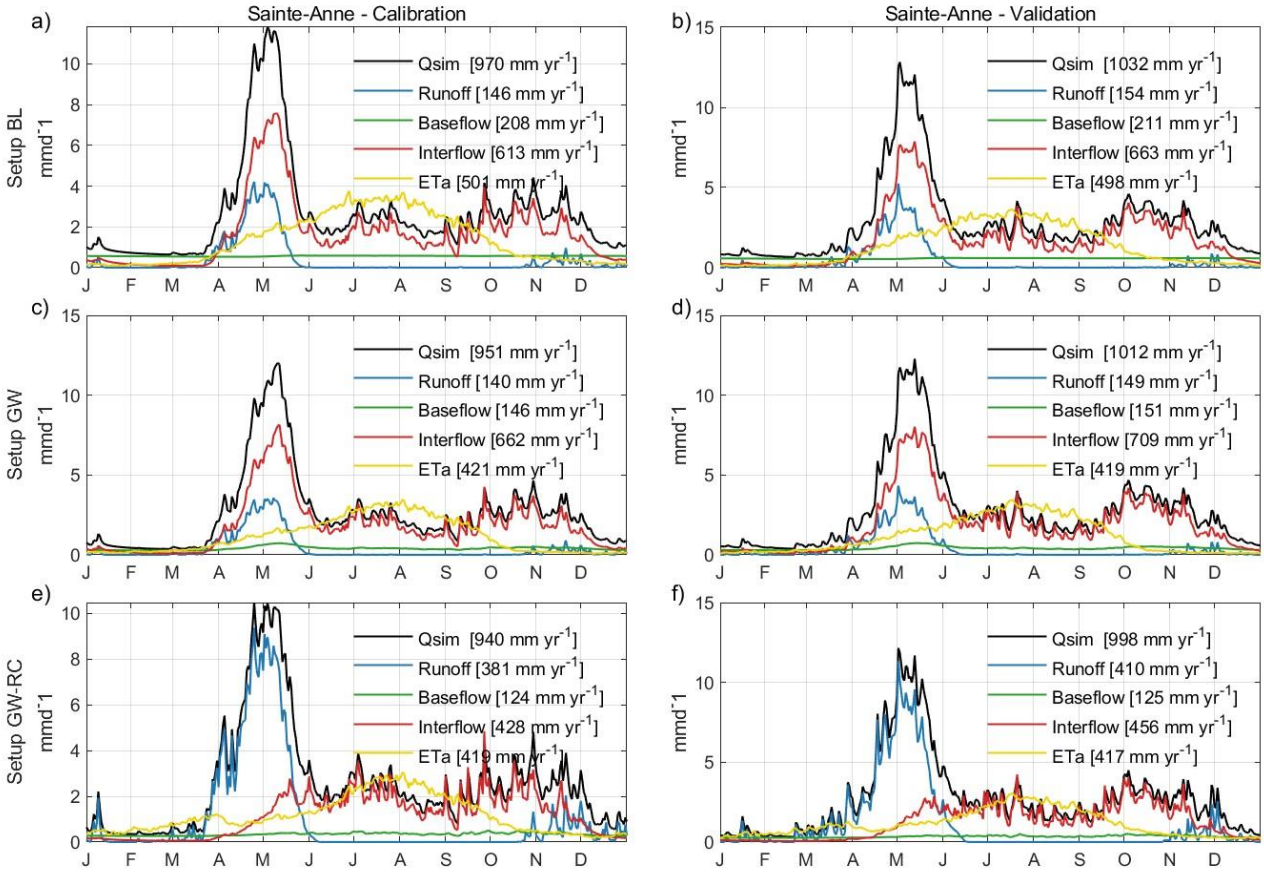


Figure S11. Same as Fig. S1, but for Sainte-Anne catchment.

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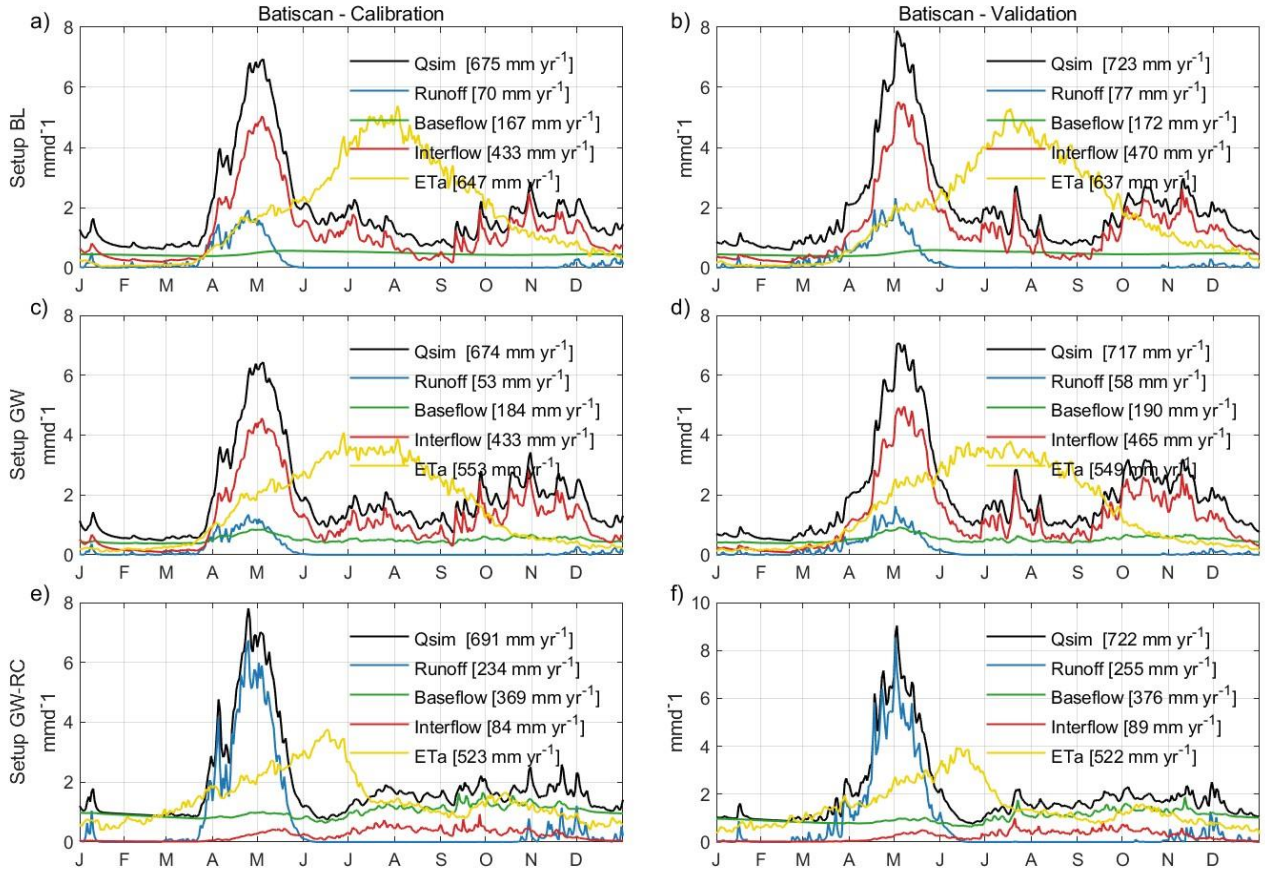

Figure S12. Same as Fig. S1, but for Batiscan catchment.

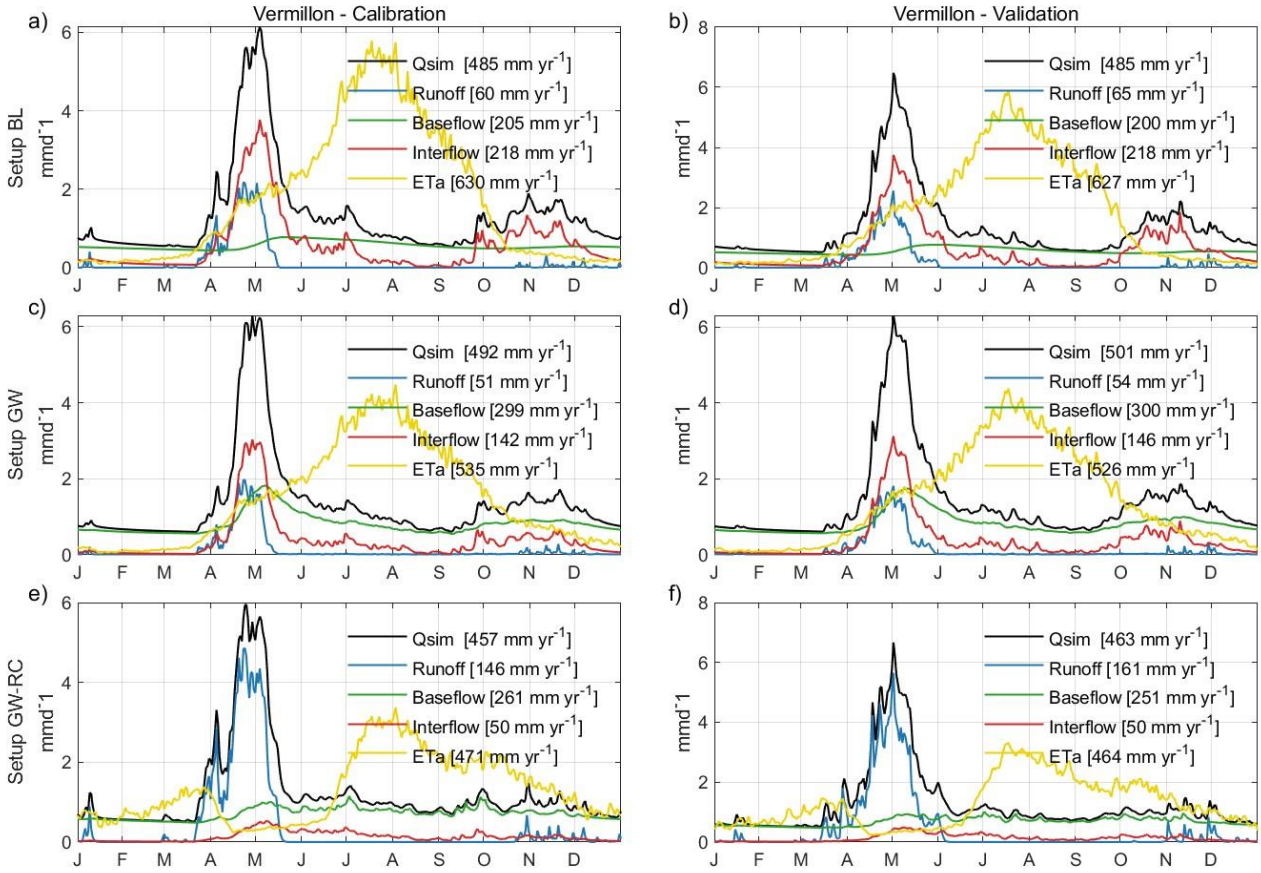

Figure S13. Same as Fig. S1, but for Vermillon catchment.

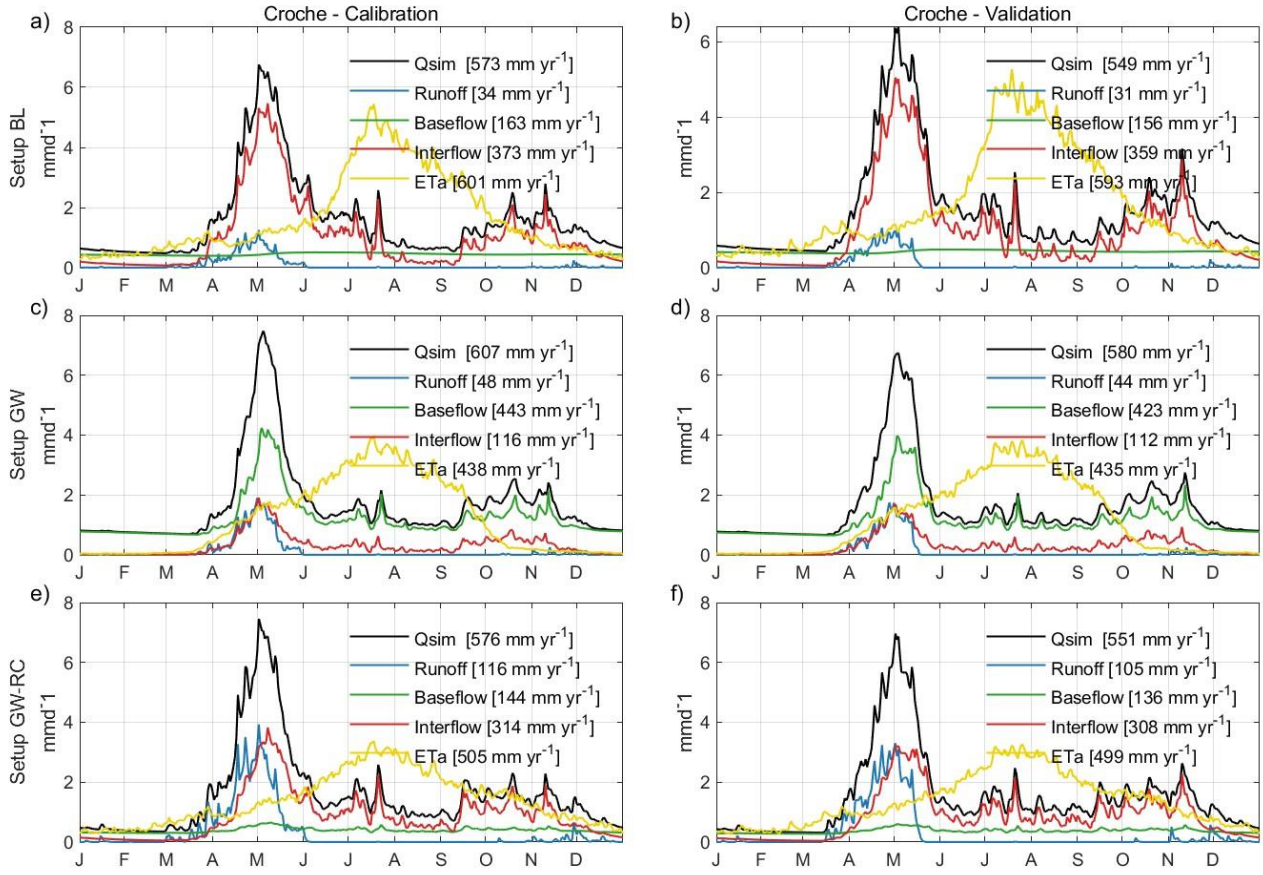

Figure S14. Same as Fig. S1, but for Croche catchment.

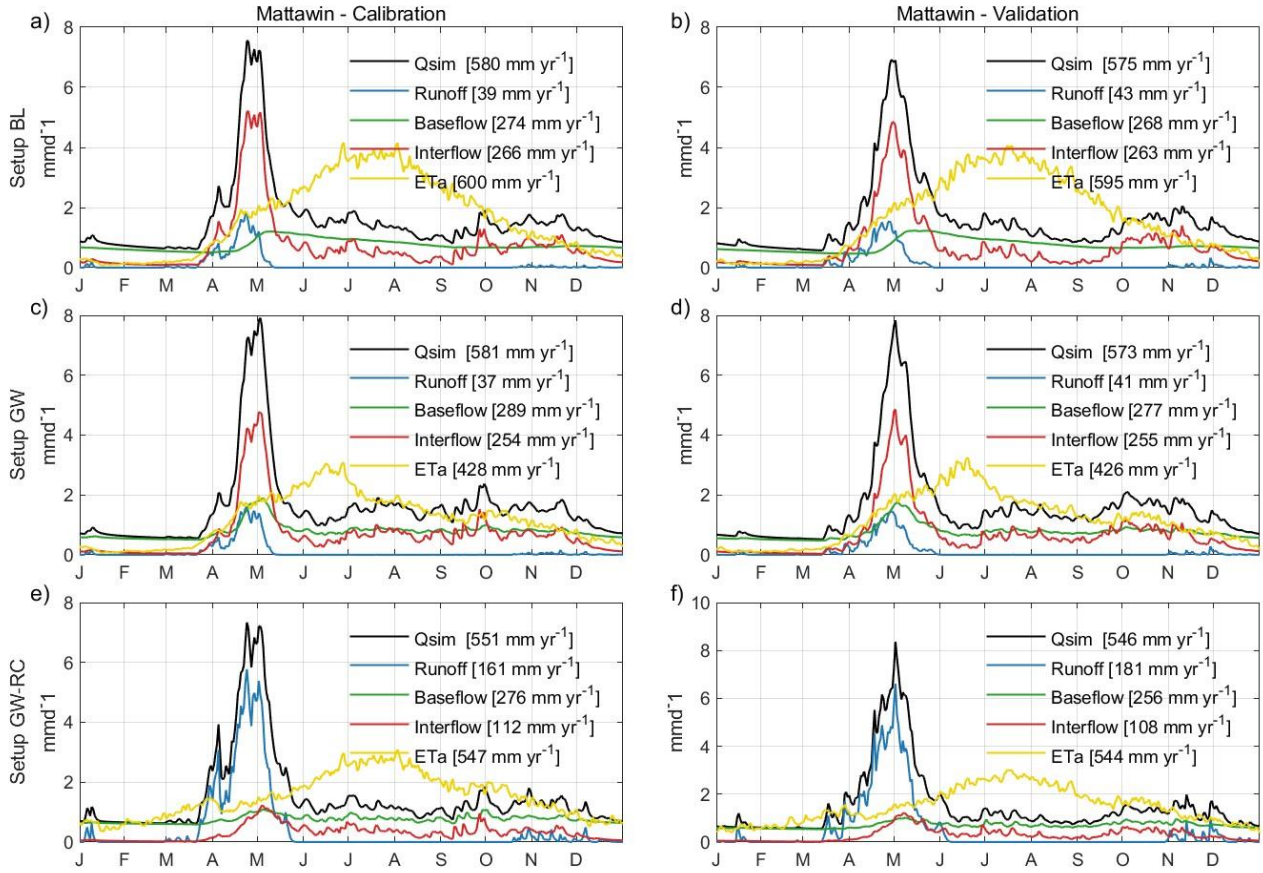

Figure S15. Same as Fig. S1, but for Mattawin catchment.

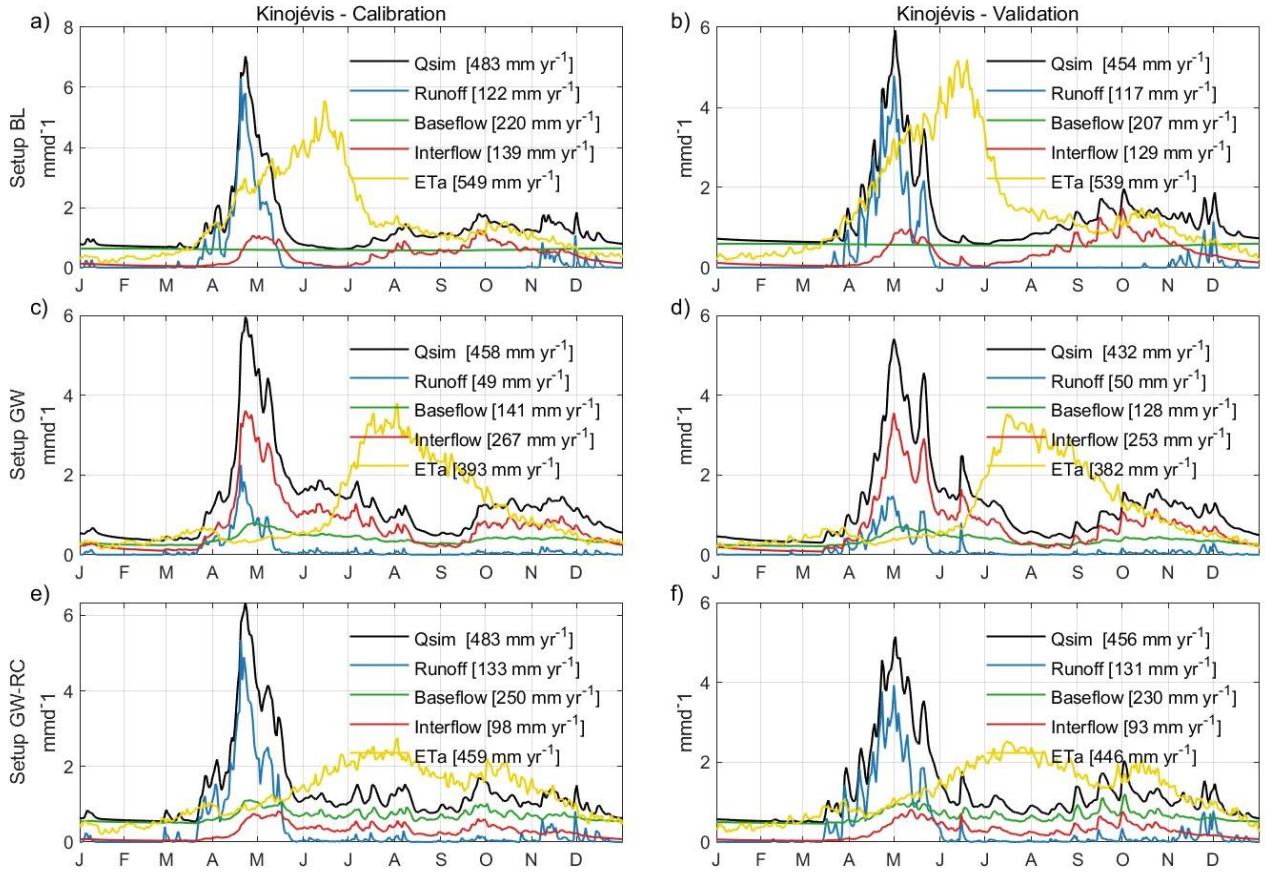

Figure S16. Same as Fig. S1, but for Kinojévis catchment.

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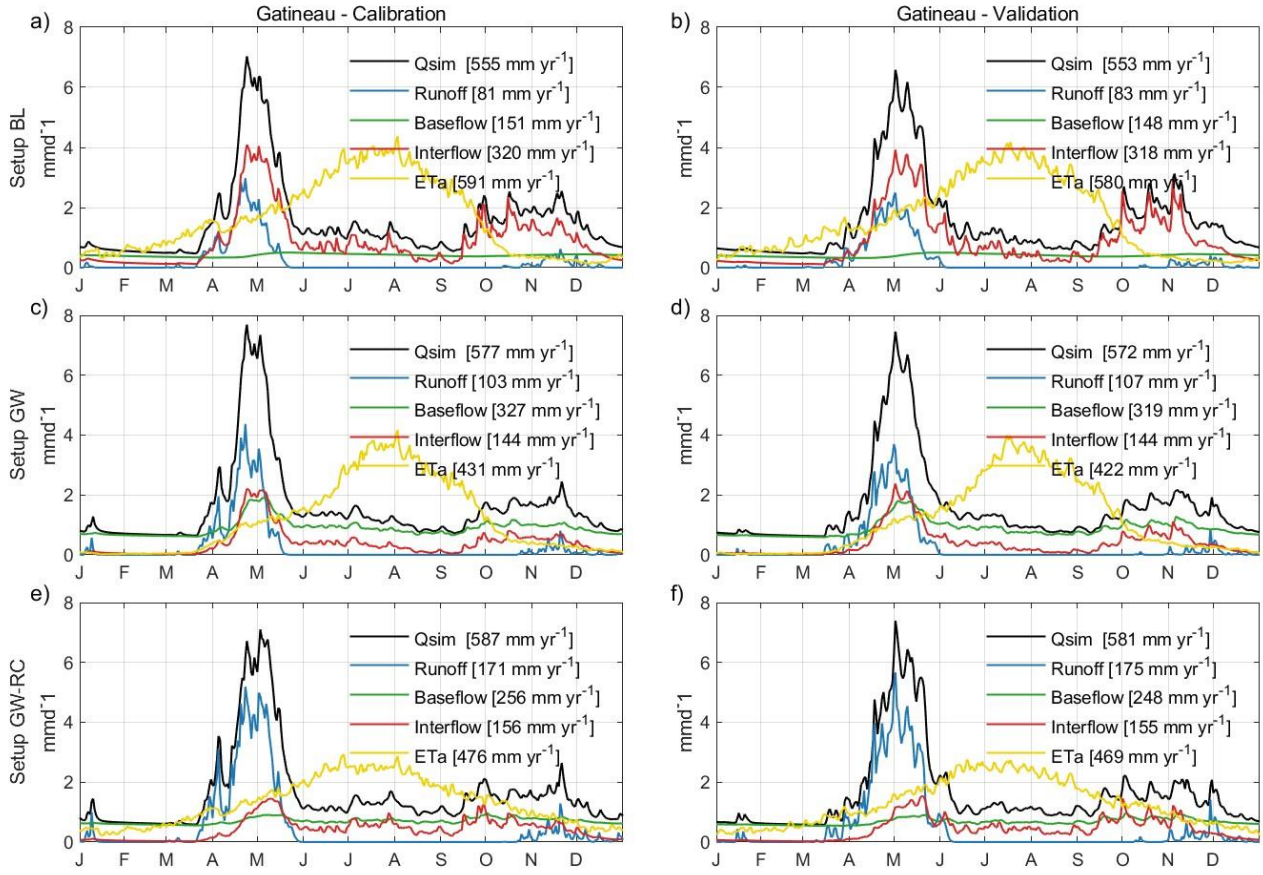


Figure S17. Same as Fig. S1, but for Gatineau catchment.

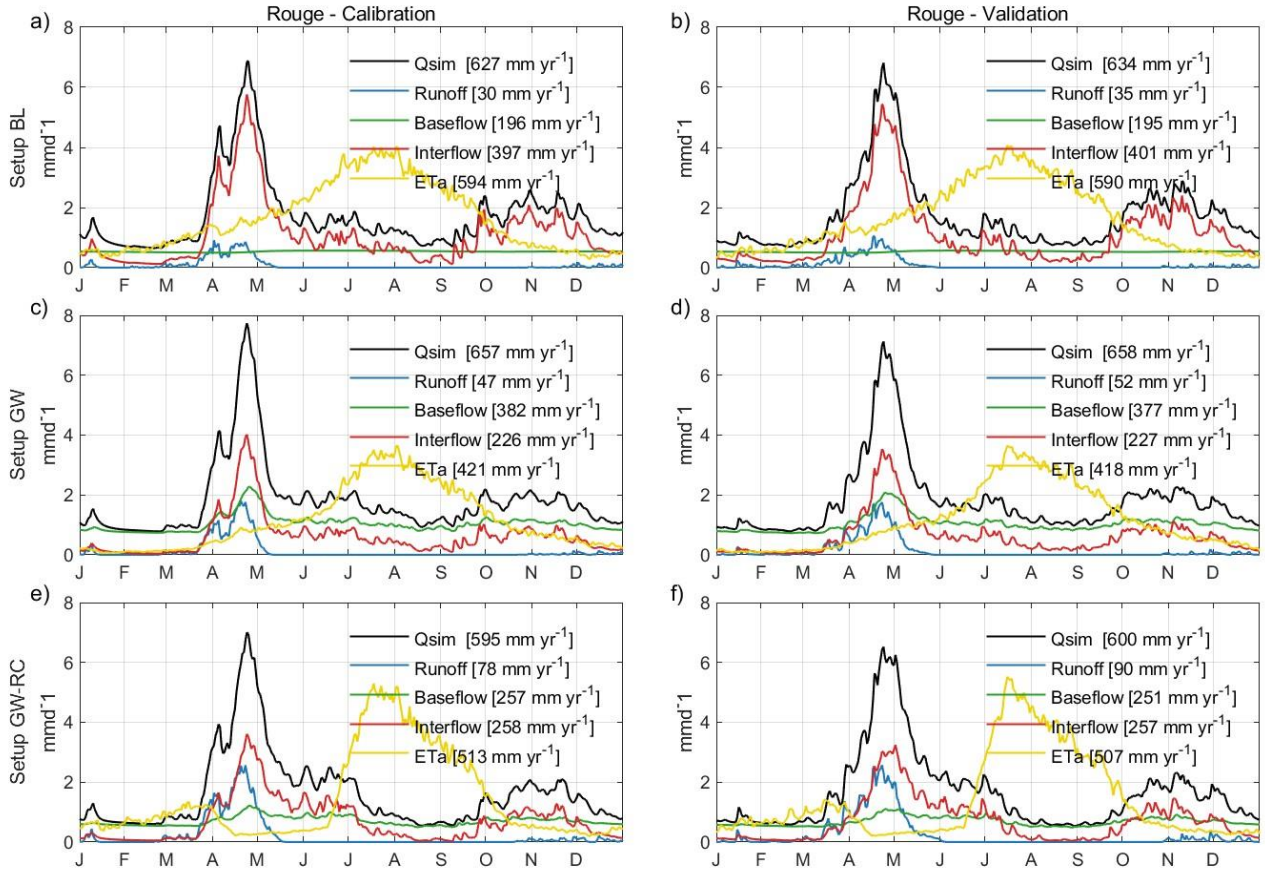


Figure S18. Same as Fig. S1, but for Rouge catchment.

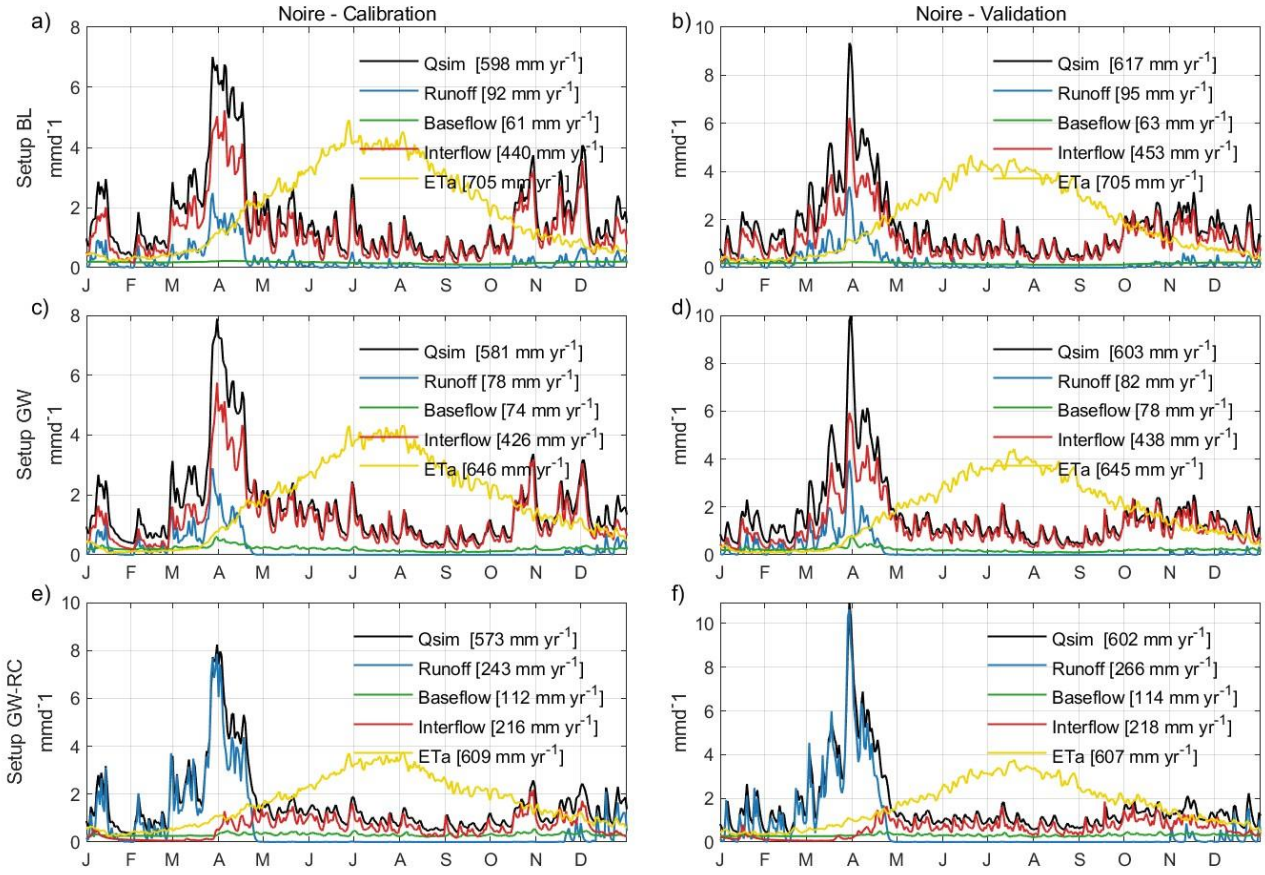


Figure S19. Same as Fig. S1, but for Noire catchment.

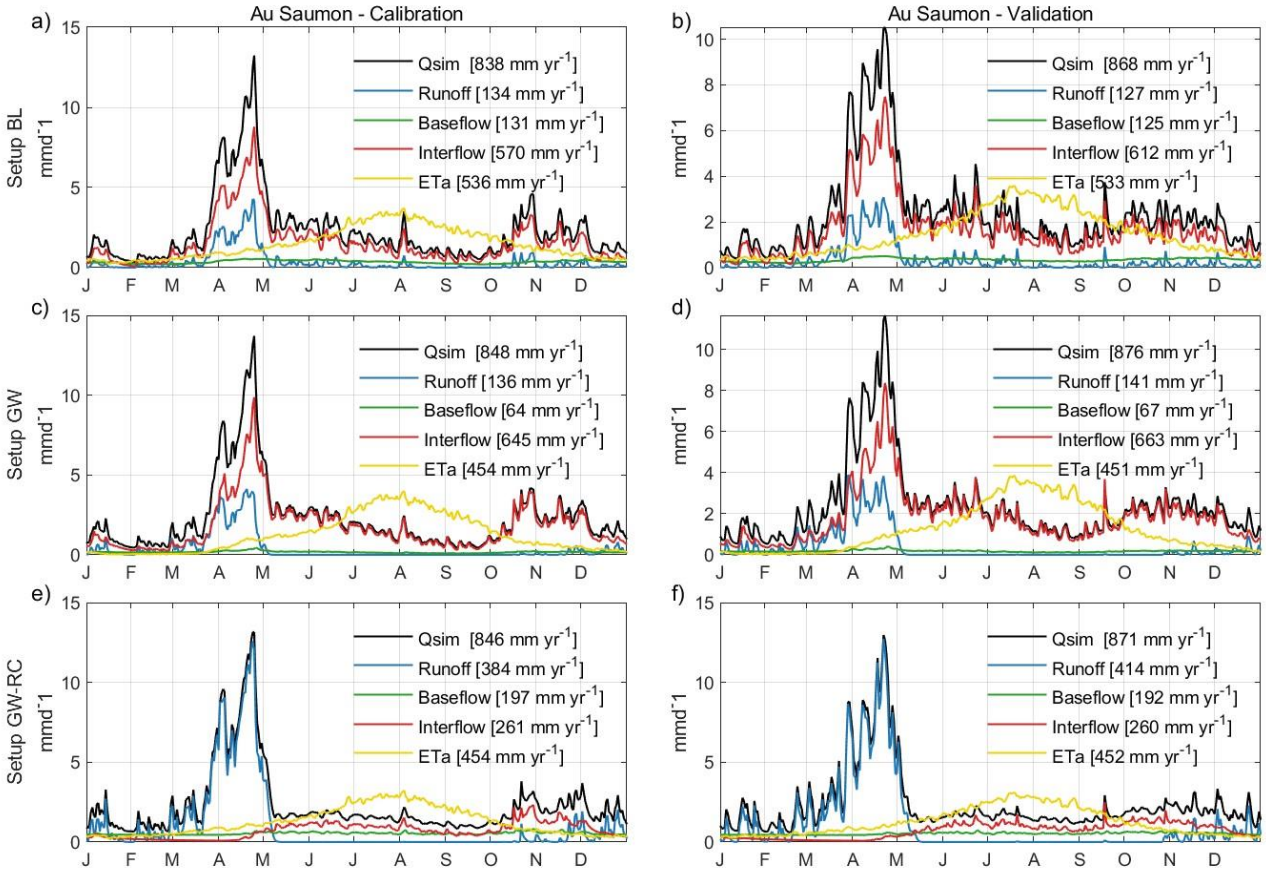


Figure S20. Same as Fig. S1, but for Au Saumon catchment.

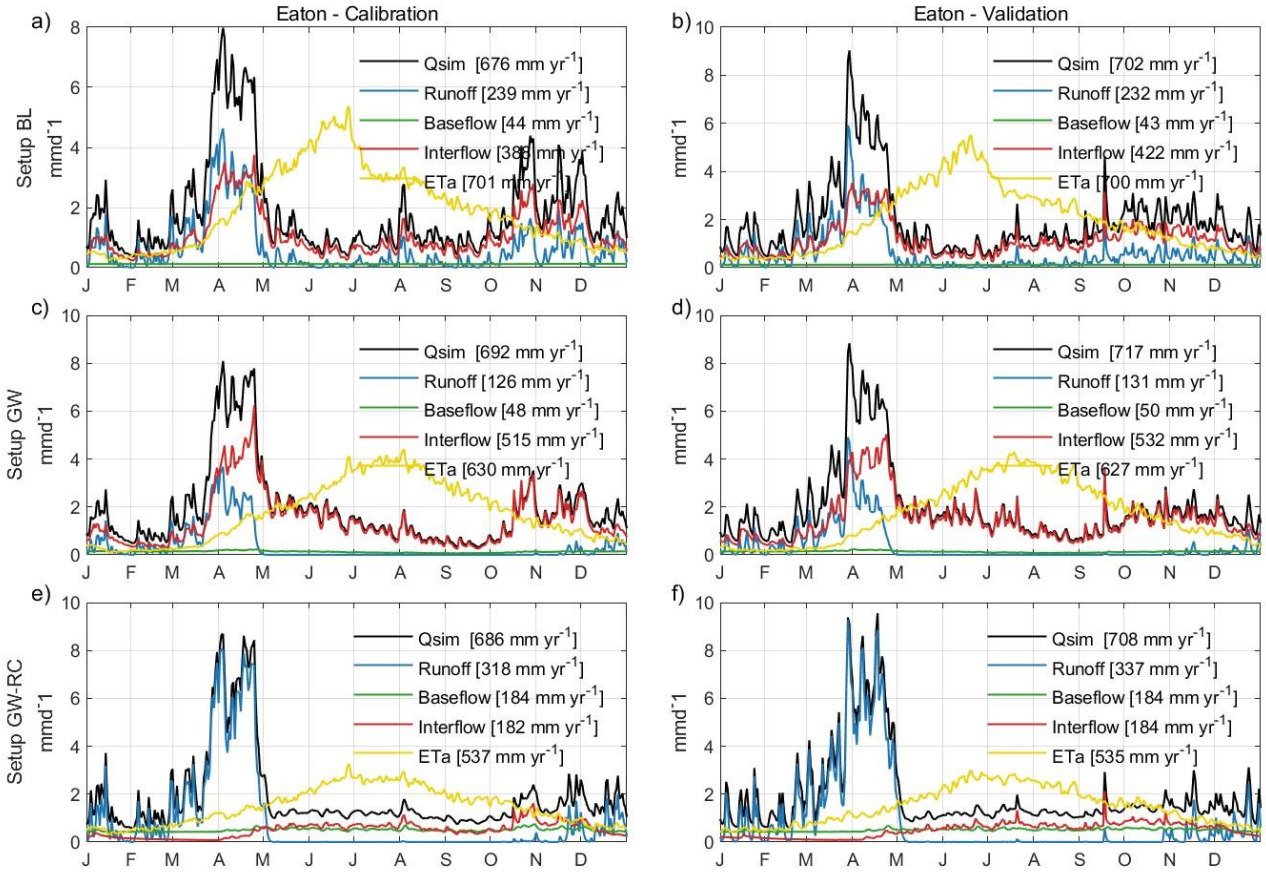


Figure S21. Same as Fig. S1, but for Eaton catchment.

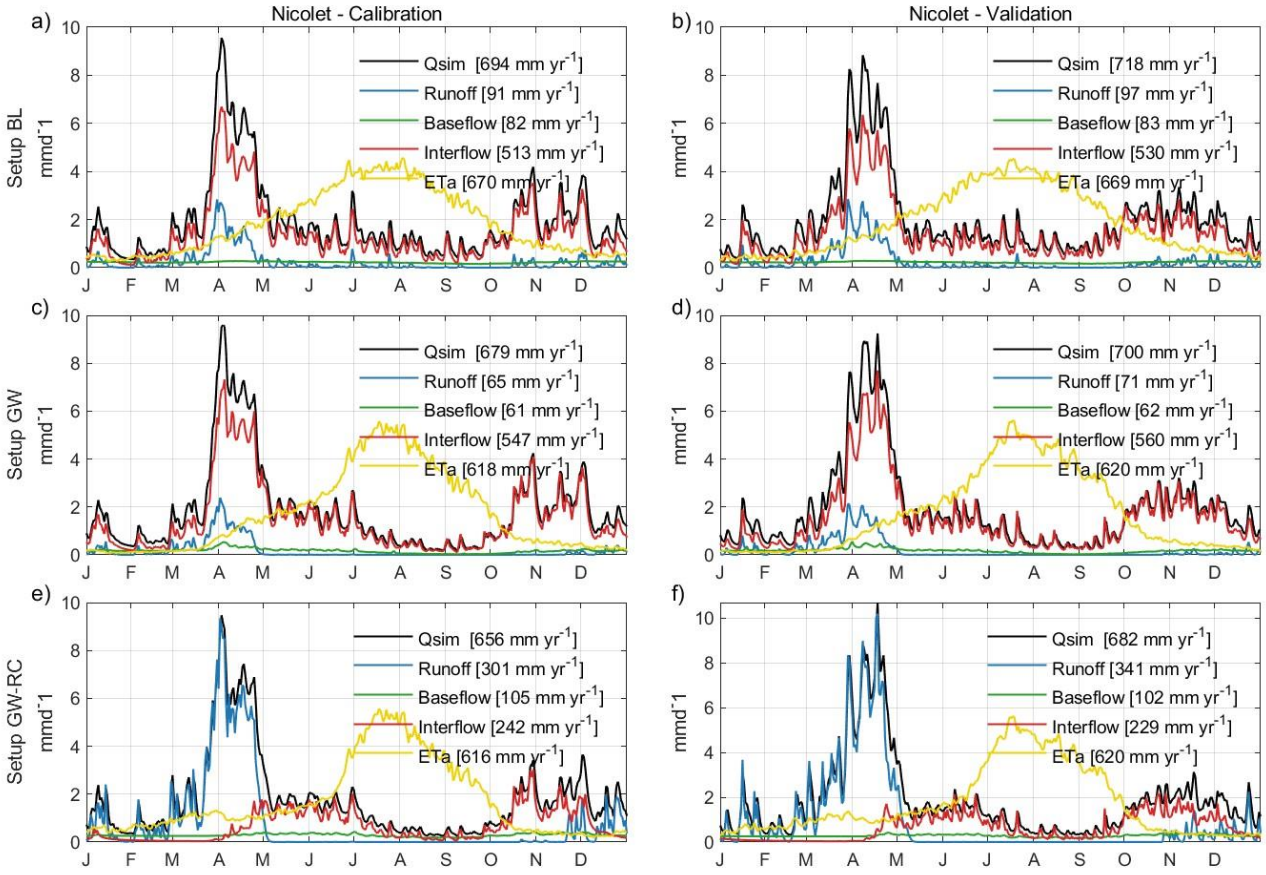
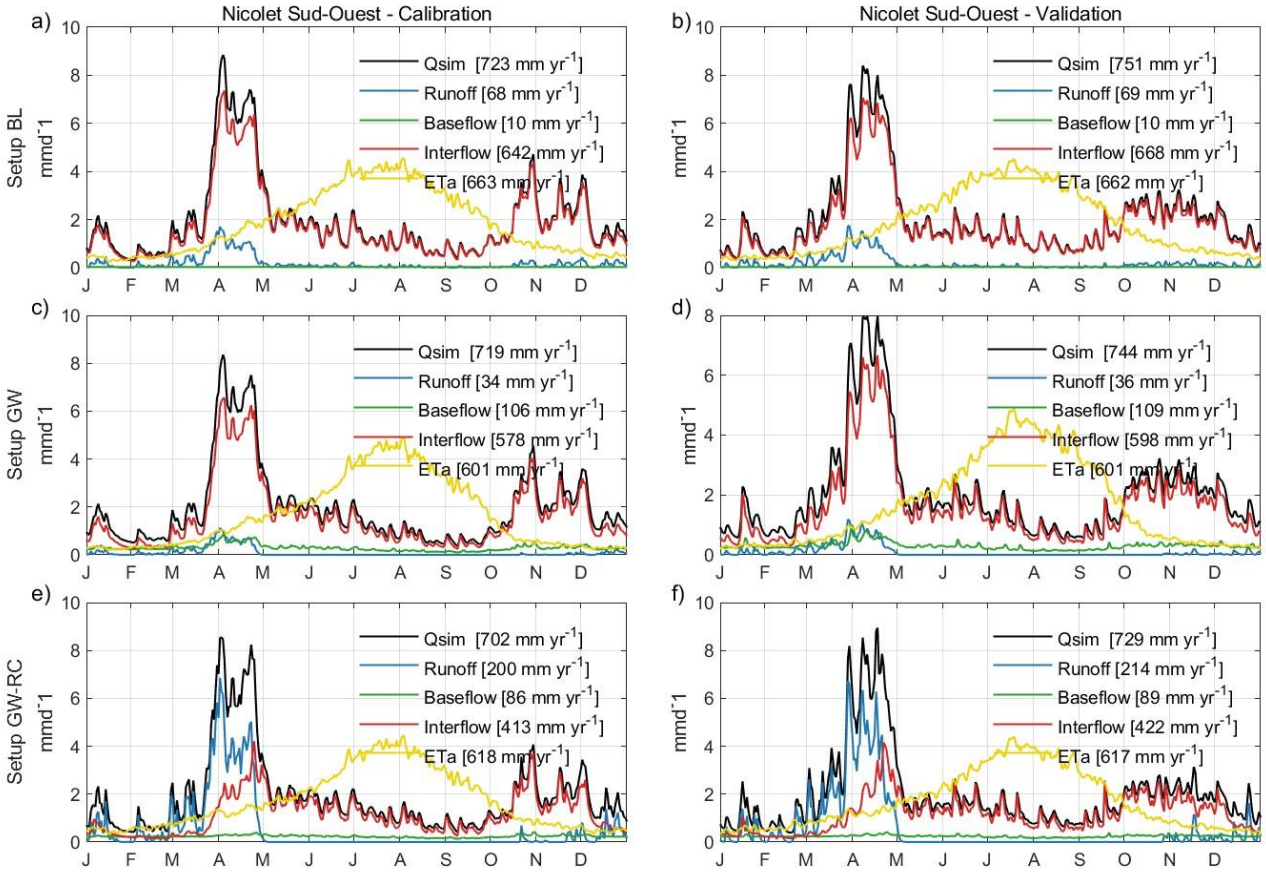


Figure S22. Same as Fig. S1, but for Nicolet catchment.



80 Figure S23. Same as Fig. S1, but for Nicolet Sud-Ouest catchment.

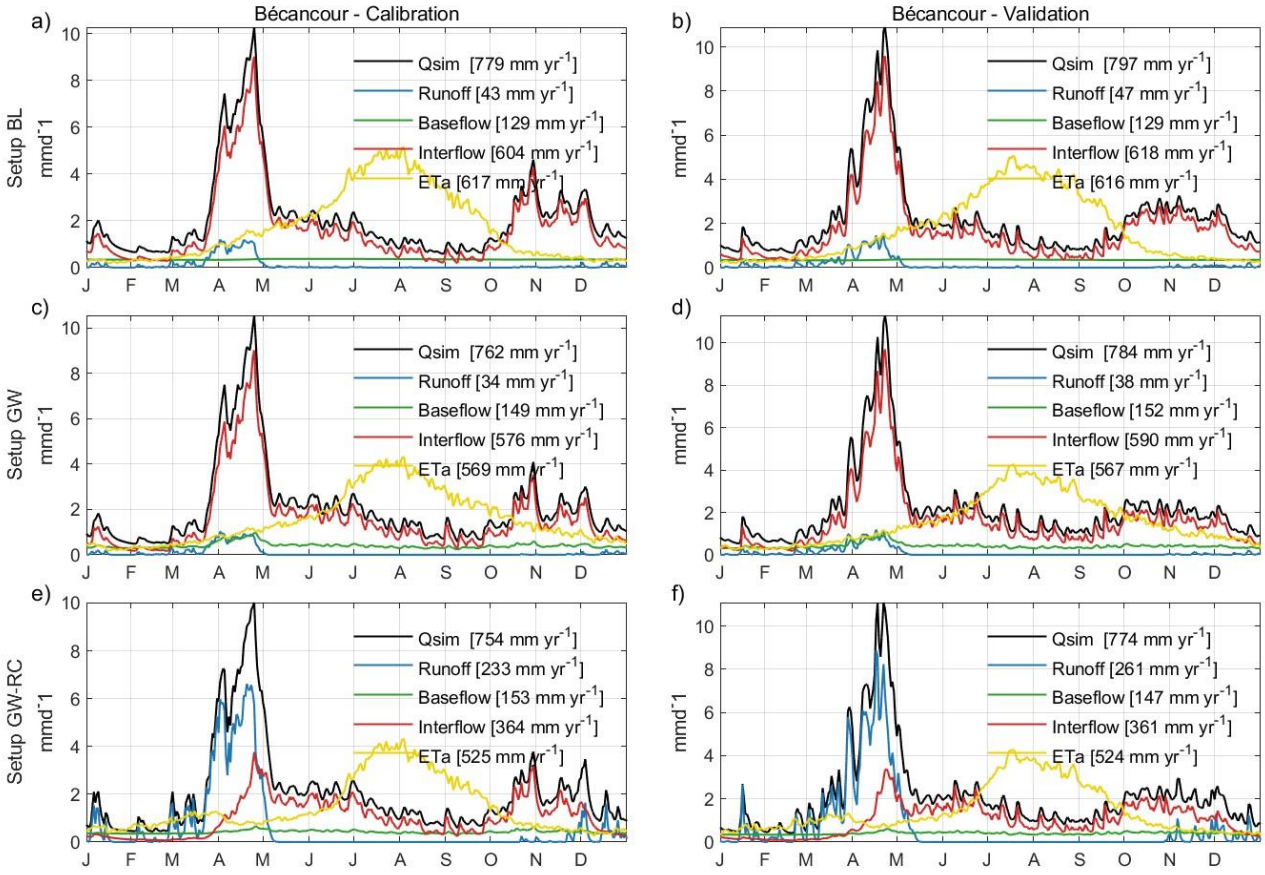


Figure S24. Same as Fig. S1, but for Bécancour catchment.

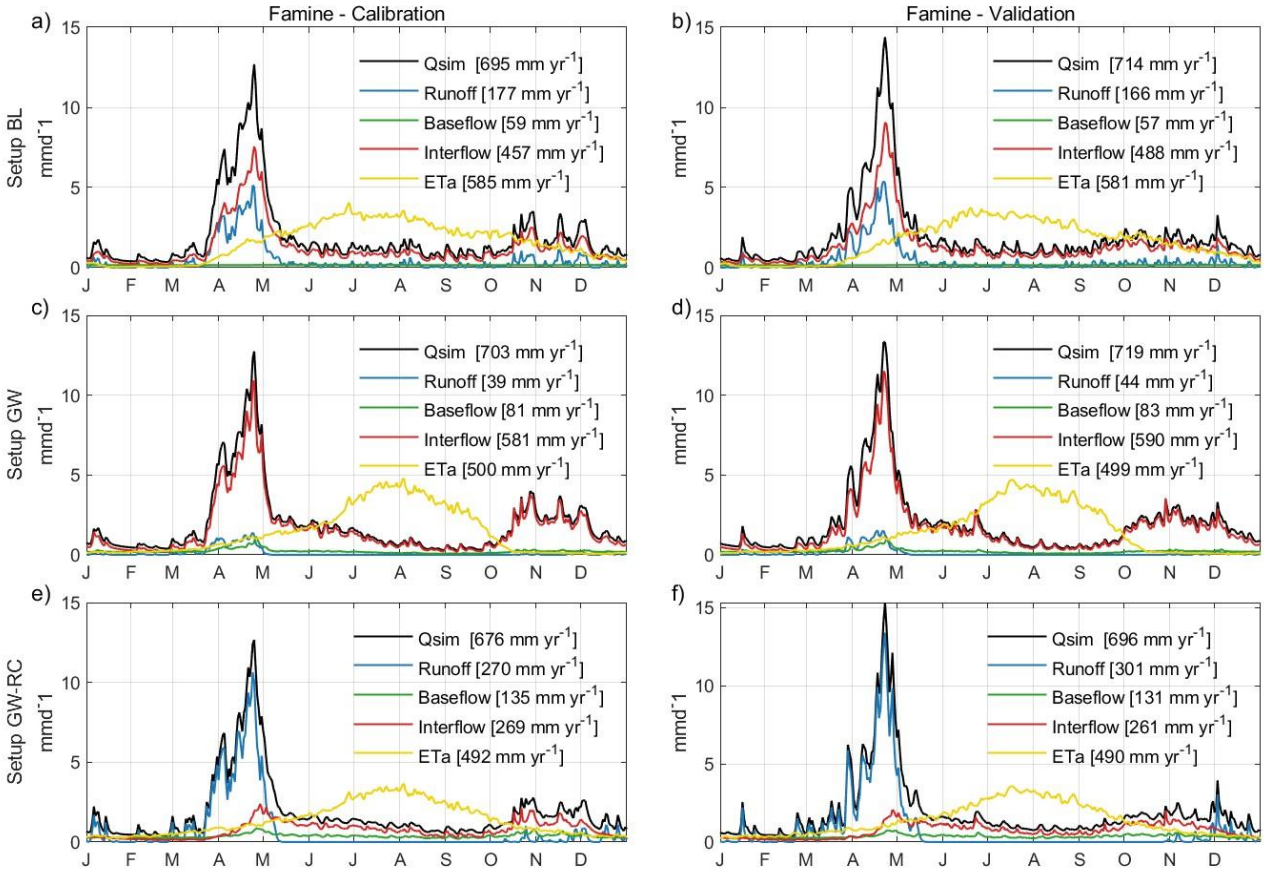


Figure S25. Same as Fig. S1, but for Famine catchment.

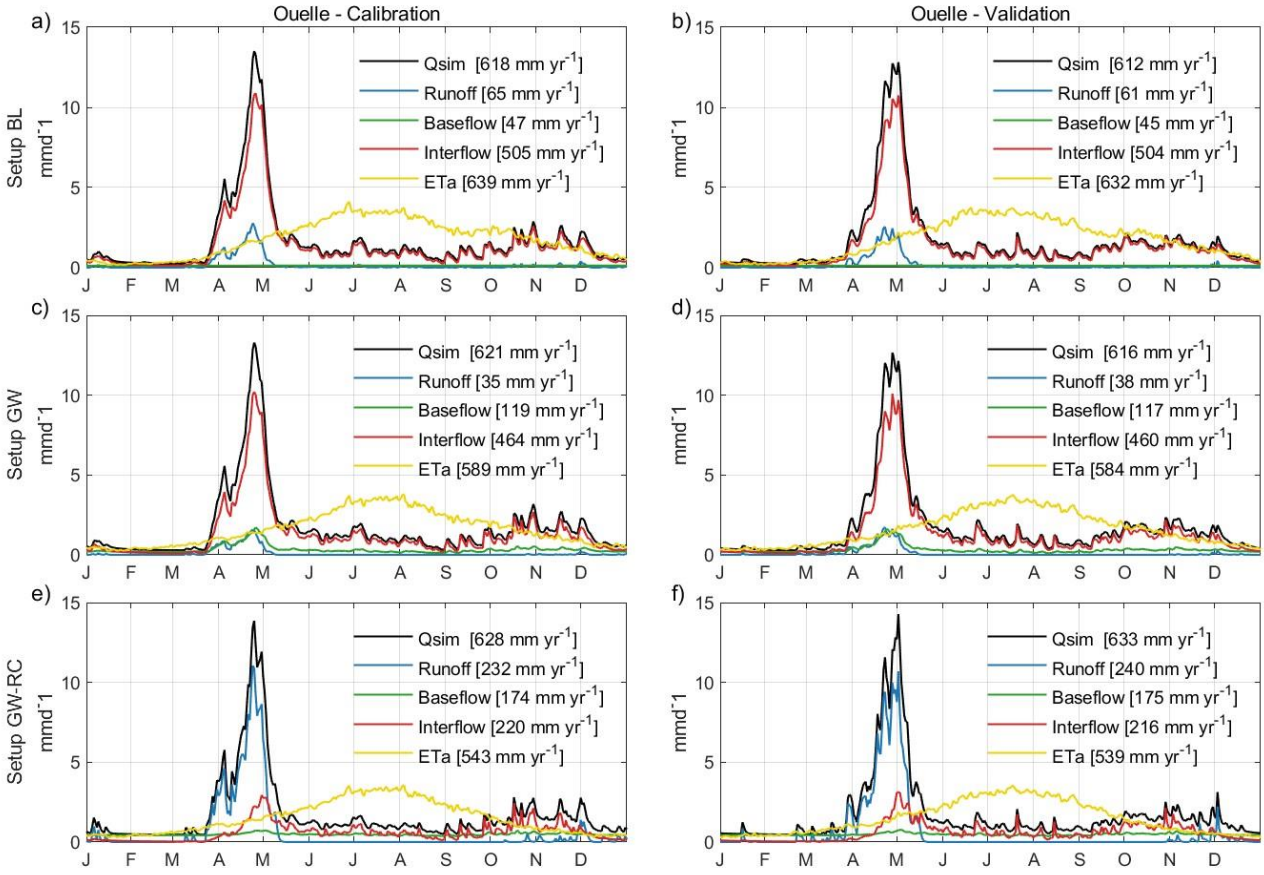


Figure S26. Same as Fig. S1, but for Ouelle catchment.

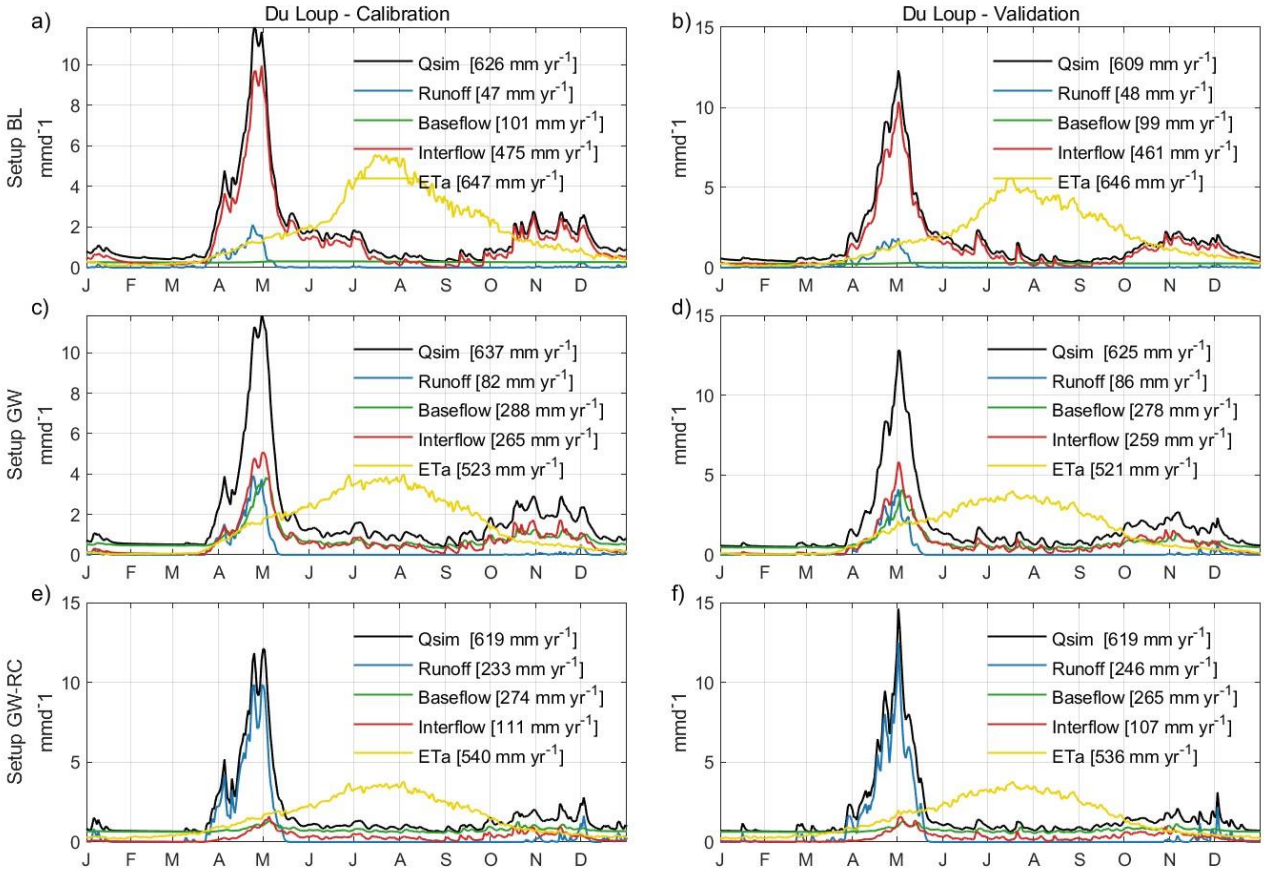
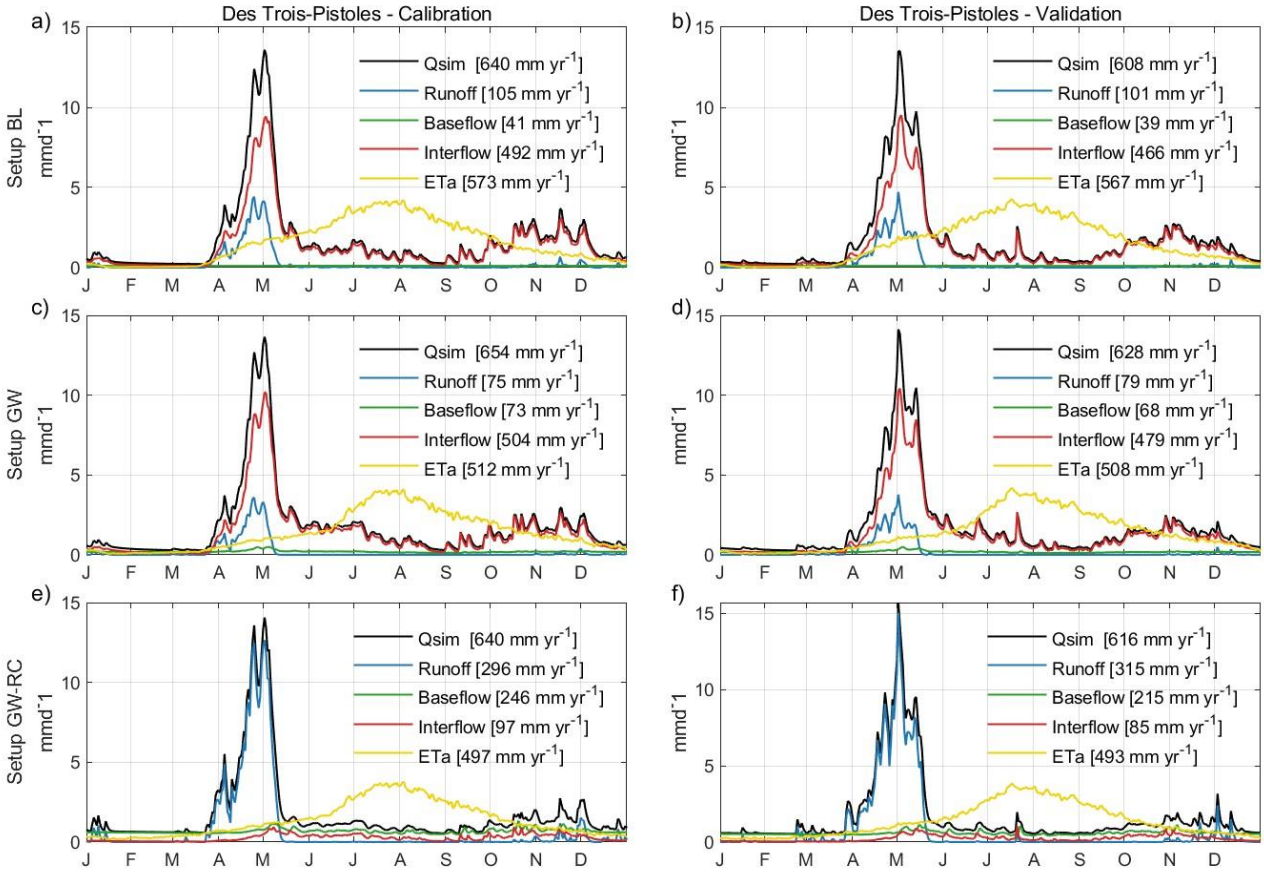


Figure S27. Same as Fig. S1, but for Du Loup catchment.



95 Figure S28. Same as Fig. S1, but for Des Trois-Pistoles catchment.

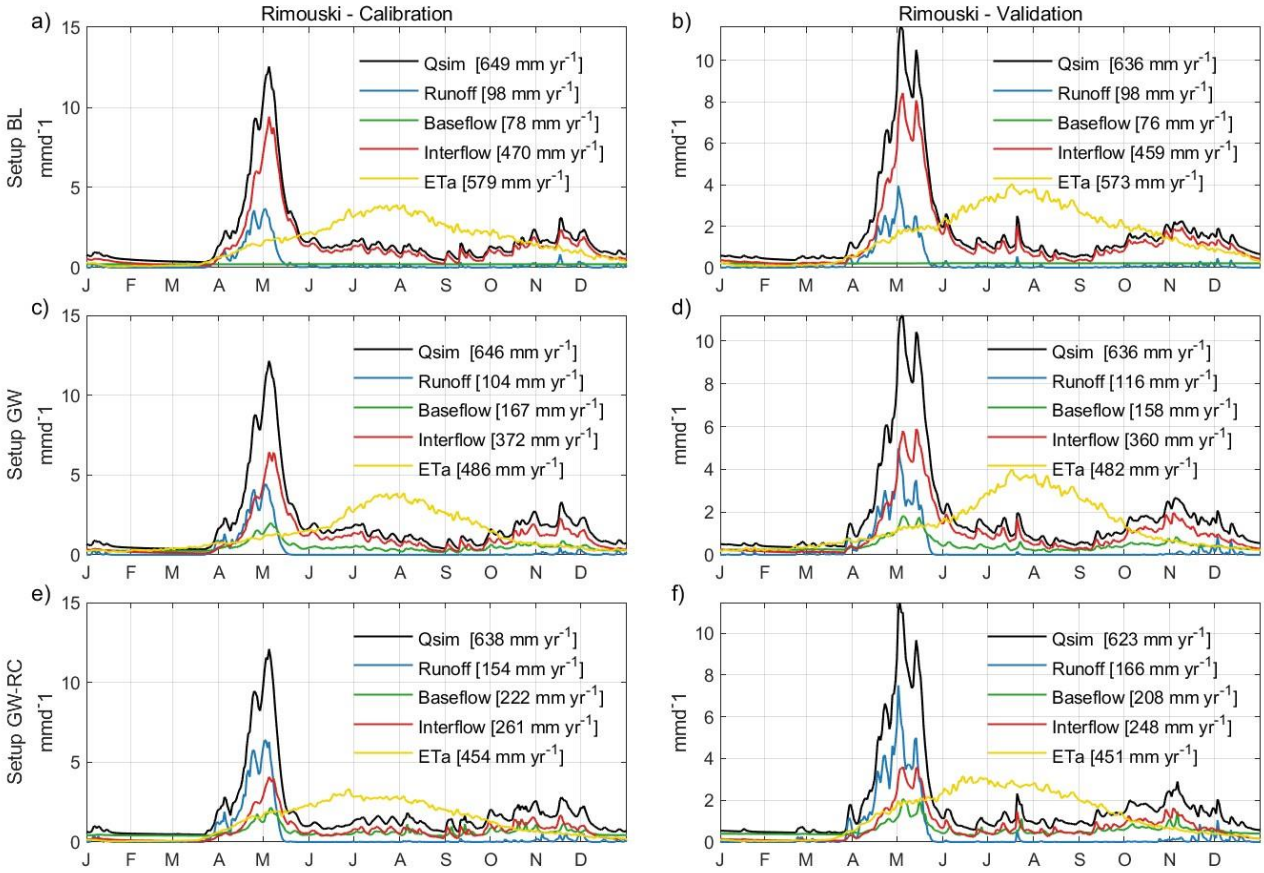


Figure S29. Same as Fig. S1, but for Rimouski catchment.

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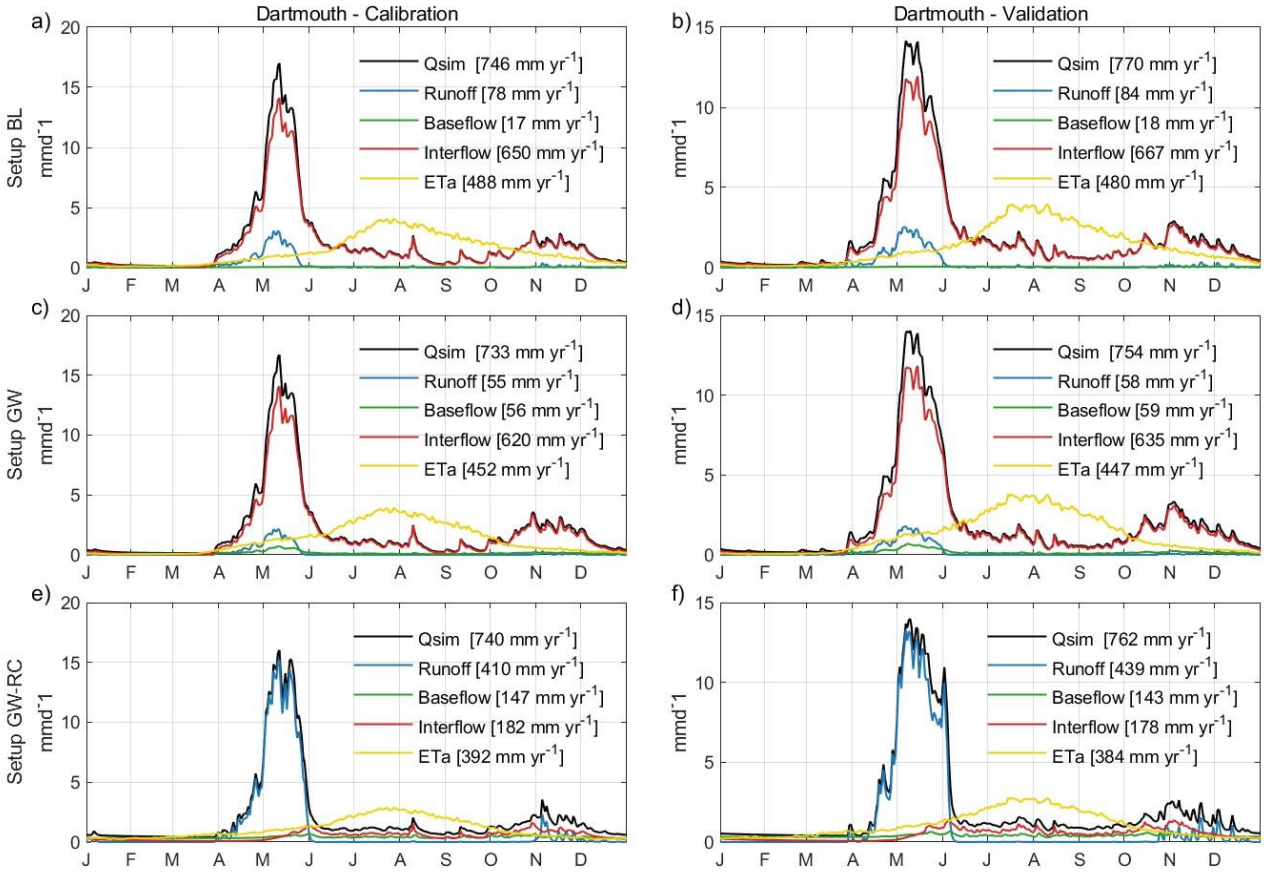

Figure S30. Same as Fig. S1, but for Dartmouth catchment.

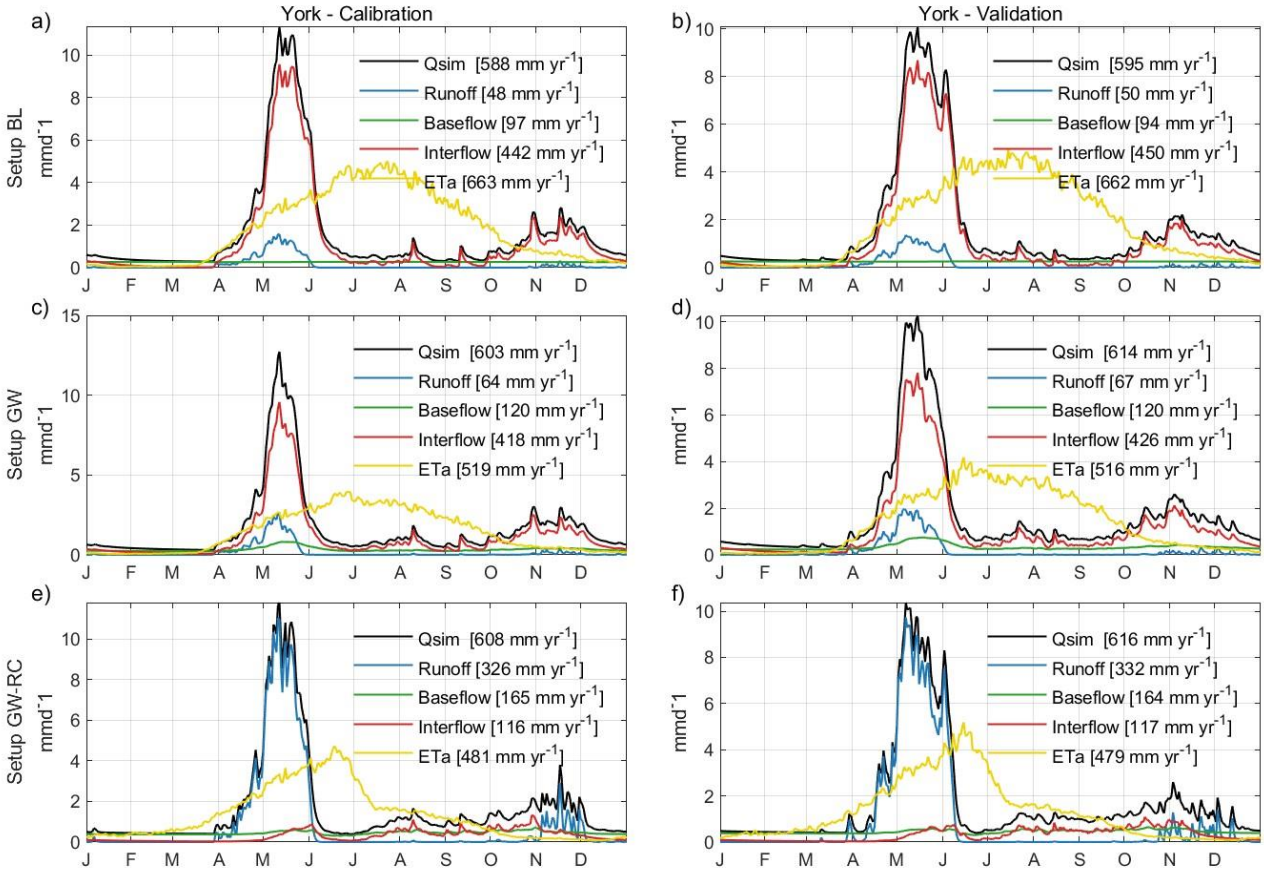

Figure S31. Same as Fig. S1, but for York catchment.

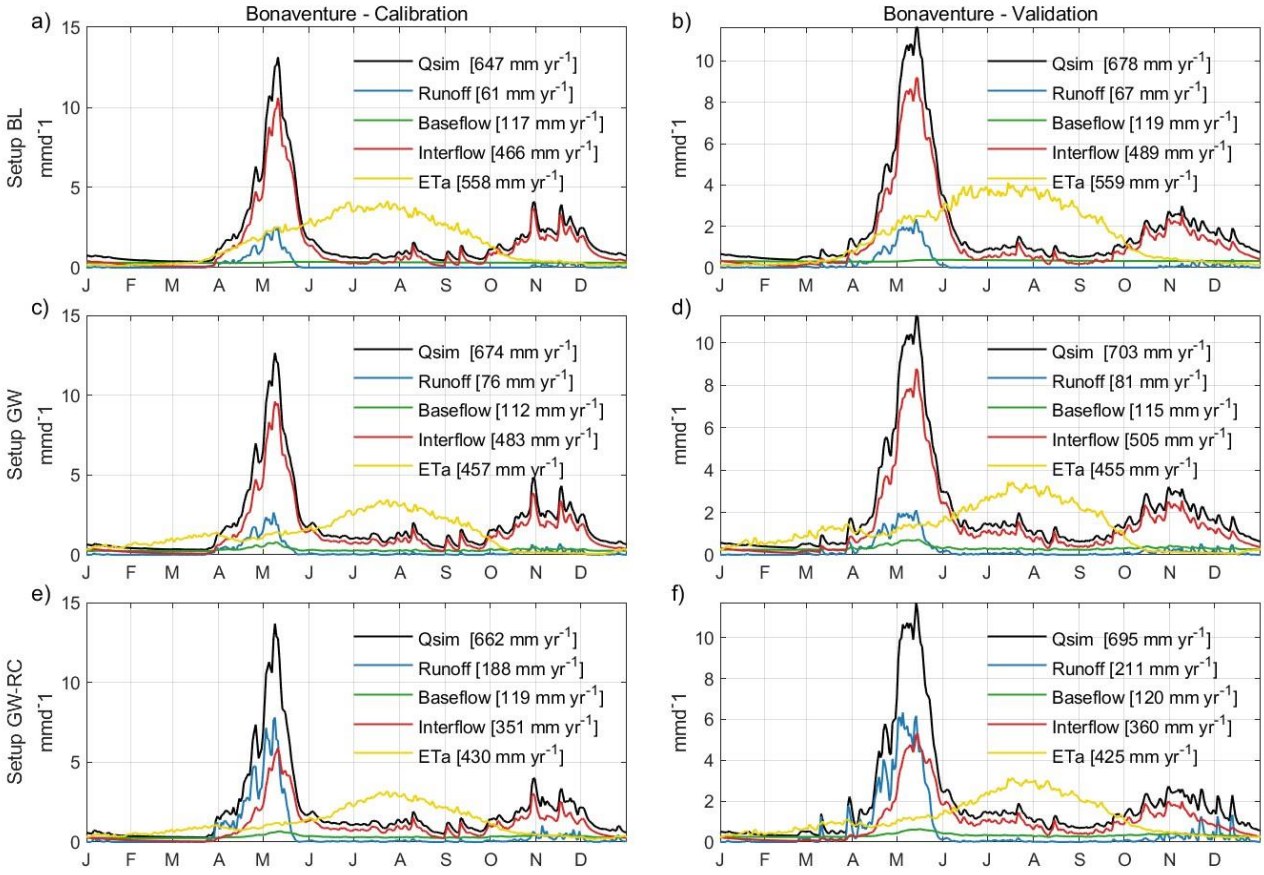

Figure S32. Same as Fig. S1, but for Bonaventure catchment.

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