Hydrology and Earth System Sciences

Supporting Information for

Spatially dependent Intensity-Duration-Frequency curves to support the design of civil infrastructure systems

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Introduction

This file contains the plots for the simulated areal reduction factors (ARFs) for rainfall of 36 hr and 9 hr durations for the case study (Fig. S1 and Fig. S2); the plots for details of the hydrological models for the Nambucca (upper) catchment and Warrell Creek catchment (Fig. S3), and the Deep Creek catchment (Fig. S4); and the QQ plots for the estimate of marginal distribution GPD for rainfall of 36 hr and 9 hr durations for all rain gauges in the case study (Fig. S5 and Fig. S6). Each QQ plot shows the theoretical quantiles vs. sample quantiles (dot points) with 95% confidence intervals (black dashed lines).

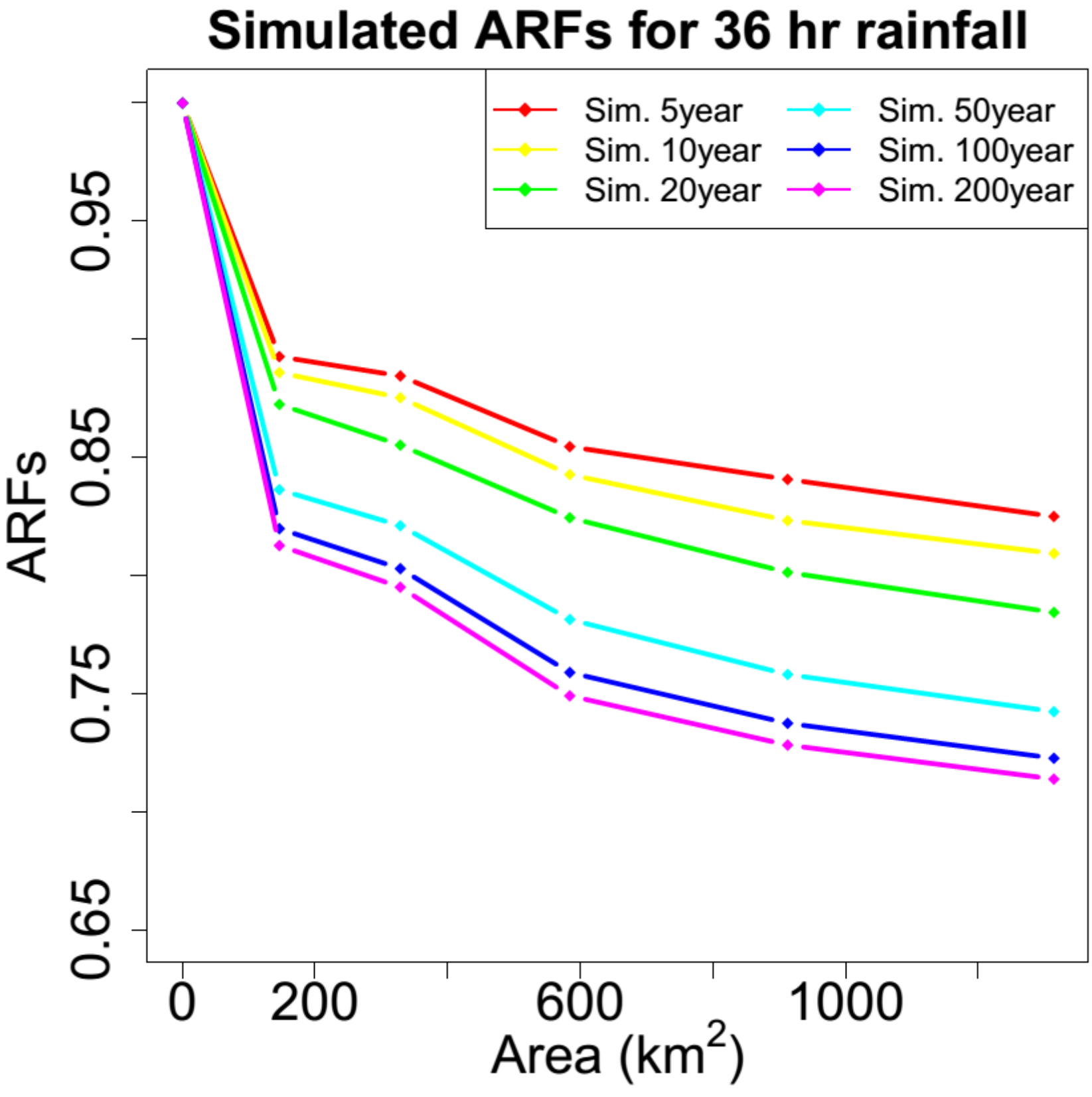

Fig. S1. Simulated ARFs for spatial rainfall of 36 hr duration for different return periods.

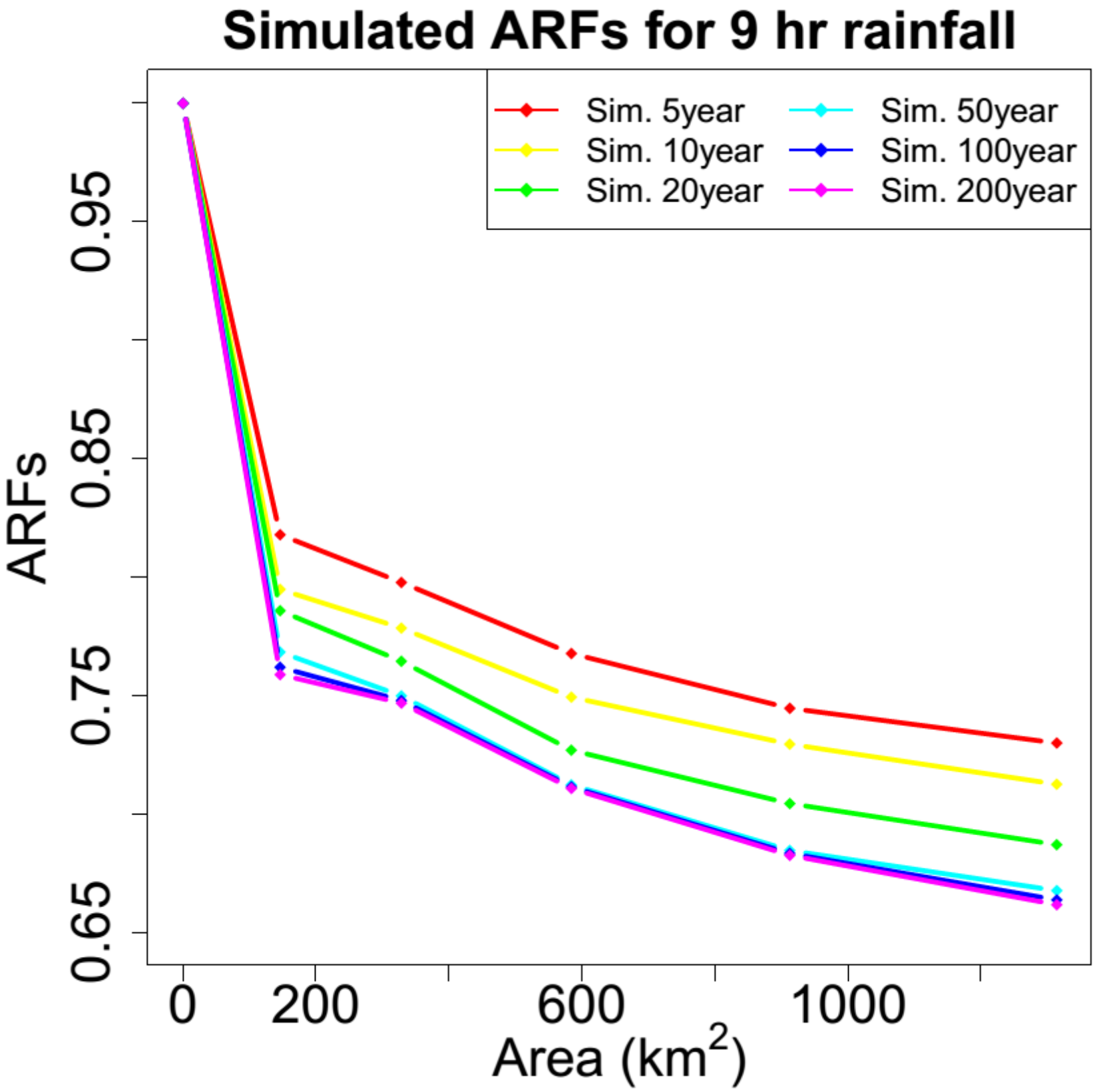

Fig. S2. Simulated ARFs for spatial rainfall of 9 hr duration for different return periods.

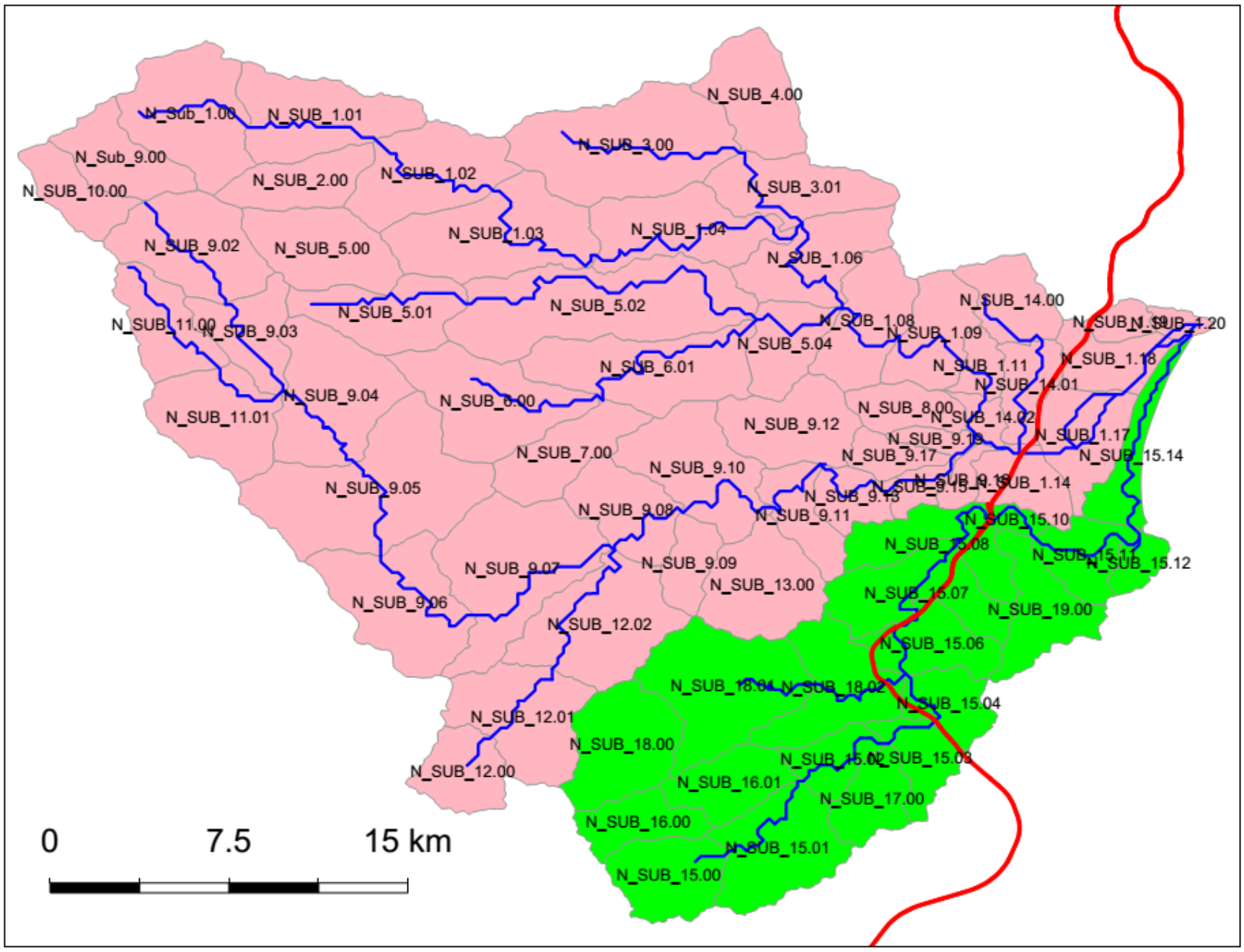

Fig. S3. Hydrological model layout for Nambucca (upper) catchment and Warrell Creek catchment. The blue lines are the river network, and the red line is the Pacific Highway upgrade project.

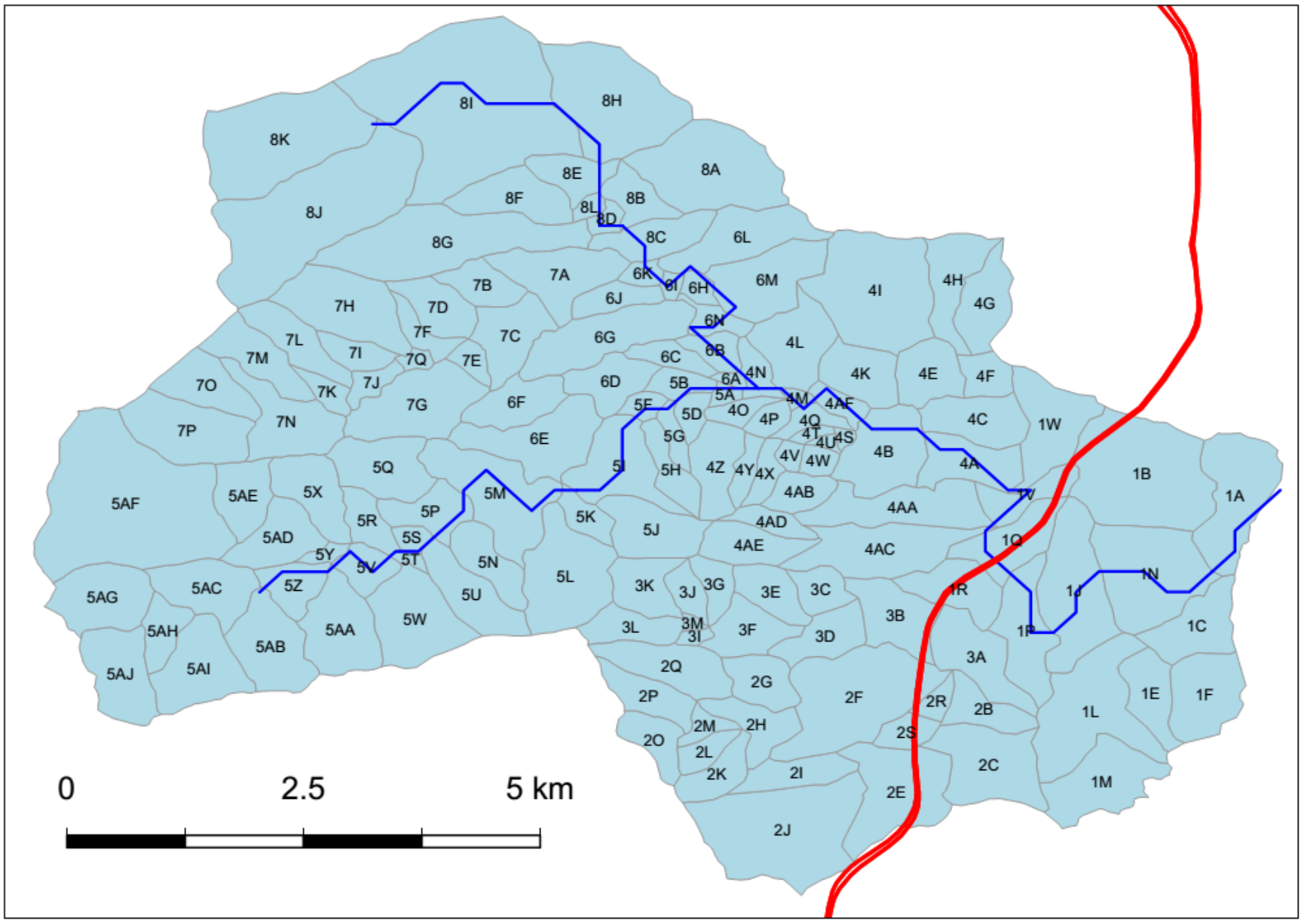

Fig. S4. Hydrological model layout for Deep Creek catchment. The blue lines are the river network, and the red line is the Pacific Highway upgrade project.

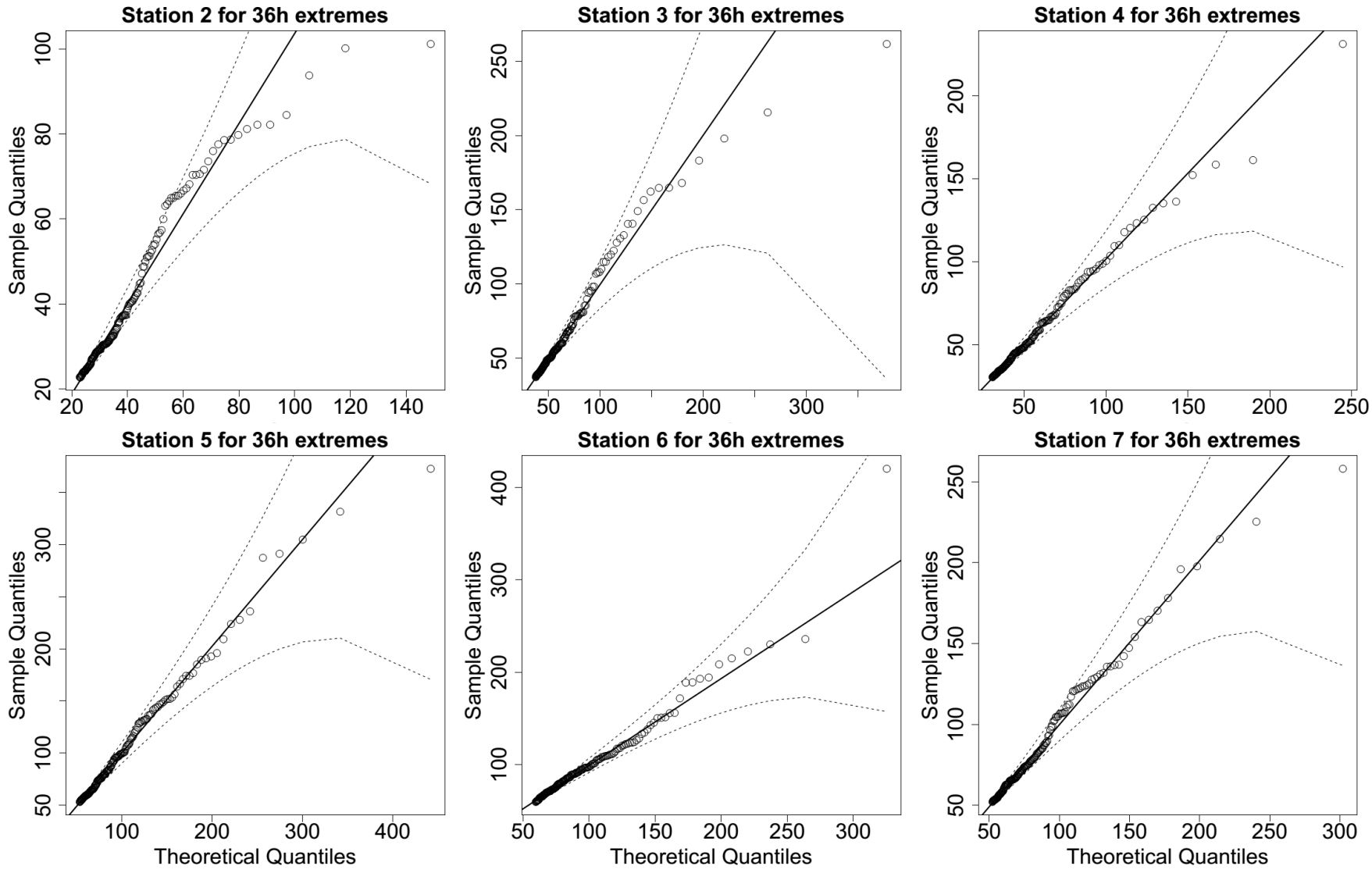

Fig. S5. QQ plots for the estimate of marginal distribution GPD for 36 hr rainfall extremes for rain gauges from 2 to 7. The solid diagonal line indicates a perfect fit, and the dotted lines indicate a 95% confidence interval.

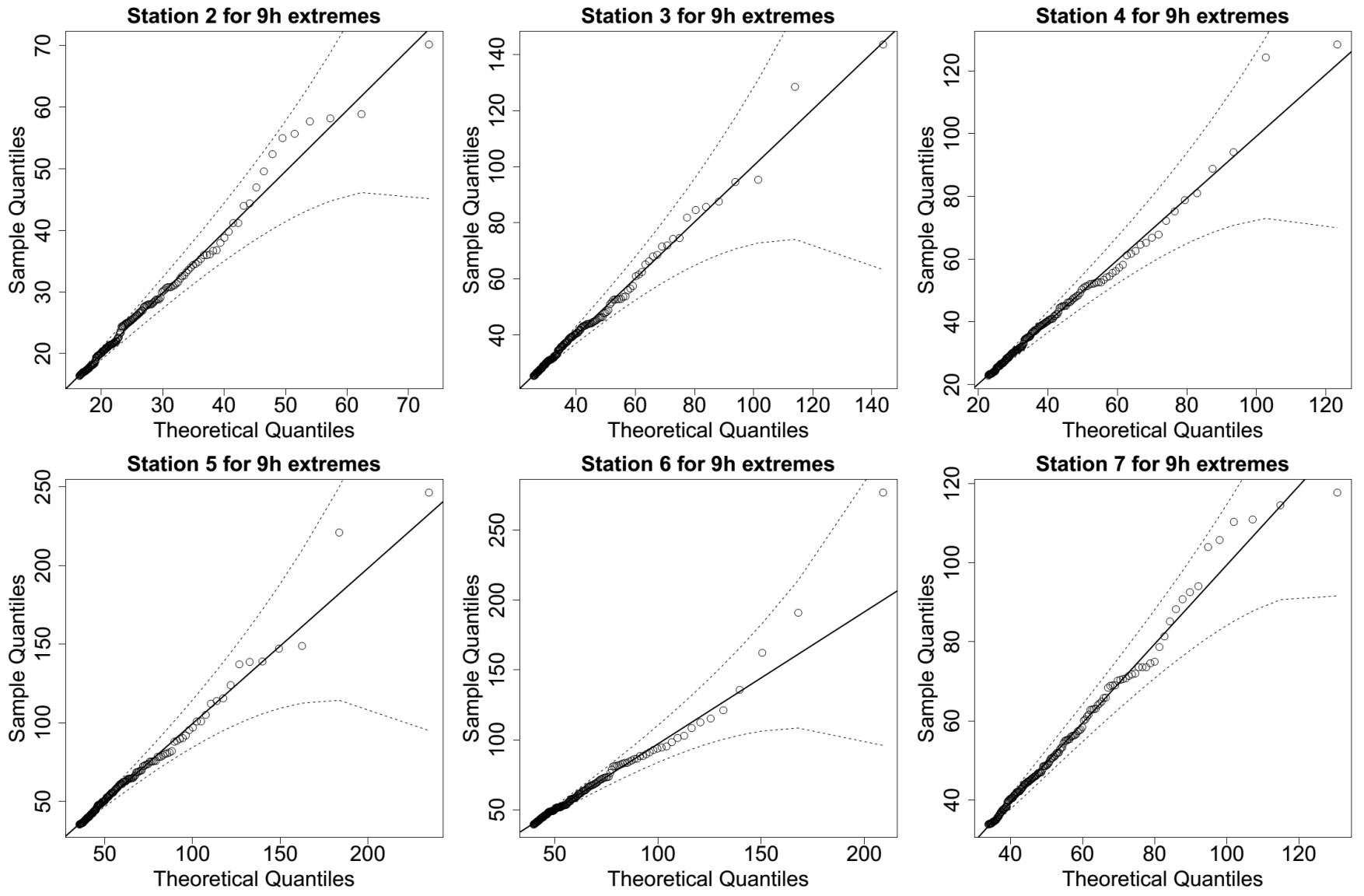

Fig. S6. QQ plots for the estimate of marginal distribution GPD for 9 hr rainfall extremes for rain gauges from 2 to 7. The solid diagonal line indicates a perfect fit, and the dotted lines indicate a 95% confidence interval.