Supplementary material.

Section A.

The performance criteria described below have been used in this study to test how well the calibrated model fits the observed data. These evaluation statistics have been selected based on recommendations in the literature (Moriasi et al., 2007; Muleta, 2012).

Nash-Sutcliffe Efficiency (NSE)

$$NSE = 1 - \frac{\sum_{i=1}^{N}(S_i - O_i)^2}{\sum_{i=1}^{N}(S_i - O_{mean})^2} \quad \text{Equation 0-1.}$$

where, "S_i" is the model simulated output and "O_i" observed hydrologic variable.

Volumetric Efficiency (VE)

$$VE = 1 - \frac{\sum_{i=1}^{N}|S_i - O_i|}{\sum_{i=1}^{N} O_i} \quad \text{Equation 0-2.}$$

Ratio of Standard Deviation of Observations to RMS (RSR)

$$RSR = \frac{\sqrt{\sum_{i=1}^{N}(S_i - O_i)^2}}{\sqrt{\sum_{i=1}^{N}(S_i - O_{mean})^2}} \quad \text{Equation 0-3.}$$

Percent bias (PBIAS)

$$PBIAS = \frac{\sum_{i=1}^{N}(O_i - S_i)}{\sum_{i=1}^{N} O_i} \cdot 100 \quad \text{Equation 0-4.}$$

Coefficient of Determination (R^2)

$$R^2 = \left(\frac{\sum_{i=1}^{N}[O_i - O_{mean}]\cdot[S_i - S_{mean}]}{\left\{\sum_{i=1}^{N}[O_i - O_{mean}]^2\right\}^{0.5}\cdot\left\{\sum_{i=1}^{N}[S_i - S_{mean}]^2\right\}^{0.5}}\right)^2 \quad \text{Equation 0-5.}$$

Cantareira basins performance criteria for Calibration and Validation periods. *Cal. = Calibration period and Val. =Validation period, are shown in the Table A-1. The classification of colors are as follows: green for "very good" (NSE > 0.75; PBIAS < ±10%; RSR < 0.50), yellow for "good or satisfactory" (0.75 > NSE > 0.5; ±10% < PBIAS < ±25%; 0.50 < RSR < 0.60), red for "unsatisfactory" (NSE < 0.5; PBIAS > ±25%; RSR > 0.70). Moreover, the correlation coefficient (R^2) and the VE criterion values close to 1.0 mean that the prediction dispersion is equal to that of the observation.

Table 0-1. Performance criteria results on the Cantareira modeled basins.

Watersheds	*Area (km²)*	*VE*		*NSE*		*RSR*		*PBIAS (%)*		*NSE_{Log}*		*R^2*	
		Cal.	*Val.*	*Cal.*	*Val.*	*Cal.*	*Val.*	*Cal.*	*Val.*	*Cal.*	*Val.*	*Cal.*	*Val.*
Sub B-F28	269.0	0.79	0.72	0.74	0.52	0.49	0.57	1.64	4.89	0.69	0.69	0.74	0.53
Sub B-F23	508.4	0.83	0.8	0.87	0.86	0.38	0.38	9.52	5.58	0.78	0.85	0.9	0.88
Sub B-F25	179.5	0.87	0.77	0.93	0.84	0.27	0.42	5.45	-9.54	0.91	0.78	0.94	0.86
Jaguarí	67.8	0.88	0.72	0.93	0.84	0.27	0.48	-3.3	-21.1	0.89	0.61	0.93	0.9

Watersheds	*Area (km²)*	*VE*		*NSE*		*RSR*		*PBIAS (%)*		*NSE_{Log}*		*R^2*	
		Cal.	*Val.*	*Cal.*	*Val.*	*Cal.*	*Val.*	*Cal.*	*Val.*	*Cal.*	*Val.*	*Cal.*	*Val.*
Jacareí	201.0	0.8	0.75	0.71	0.87	0.44	0.42	2.08	-1.54	0.49	0.75	0.79	0.87

Watersheds	*Area (km²)*	*VE*		*NSE*		*RSR*		*PBIAS (%)*		*NSE_{Log}*		*R^2*	
		Cal.	*Val.*	*Cal.*	*Val.*	*Cal.*	*Val.*	*Cal.*	*Val.*	*Cal.*	*Val.*	*Cal.*	*Val.*
Sub B-F24	172.8	0.83	0.78	0.85	0.76	0.41	0.47	-9.91	10.5	0.83	0.79	0.89	0.82
Sub B-F30	119.7	0.92	0.85	0.85	0.73	0.36	0.5	1.54	2.56	0.84	0.79	0.86	0.73
Cachoeira	97.1	0.71	0.70	0.78	0.81	0.5	0.53	-20.3	-13.5	0.58	0.53	0.87	0.85

Watersheds	*Area (km²)*	*VE*		*NSE*		*RSR*		*PBIAS (%)*		*NSE_{Log}*		*R^2*	
		Cal.	*Val.*	*Cal.*	*Val.*	*Cal.*	*Val.*	*Cal.*	*Val.*	*Cal.*	*Val.*	*Cal.*	*Val.*
Sub B-F34	135.5	0.85	0.84	0.53	0.35	0.7	0.68	14.6	2.59	0.42	0.38	0.84	0.69
Atibainha	176.2	0.80	0.72	0.75	0.74	0.44	0.53	9.41	-12.2	0.77	0.66	0.83	0.85

Watersheds	*Area (km²)*	*VE*		*NSE*		*RSR*		*PBIAS (%)*		*NSE_{Log}*		*R^2*	
		Cal.	*Val.*	*Cal.*	*Val.*	*Cal.*	*Cal.*	*Val.*	*Val.*	*Cal.*	*Val.*	*Cal.*	*Val.*
P. Castro	333.7	0.81	0.78	0.73	0.72	0.58	0.53	-2.81	8.54	0.67	0.63	0.9	0.74

Section B.

Figure Fig. B-1 it is possible to observe that in the future there is no clear a trend in the averaged discharge, since in some periods the curve exhibits increase and in other periods decrease. In addition, the average discharge per time period showed higher values during the 2041-2070 scenario, on the other hand, the average discharge per model showed higher values in the Eta/HadGEM model results, compared to the Eta/MIROC5 model.

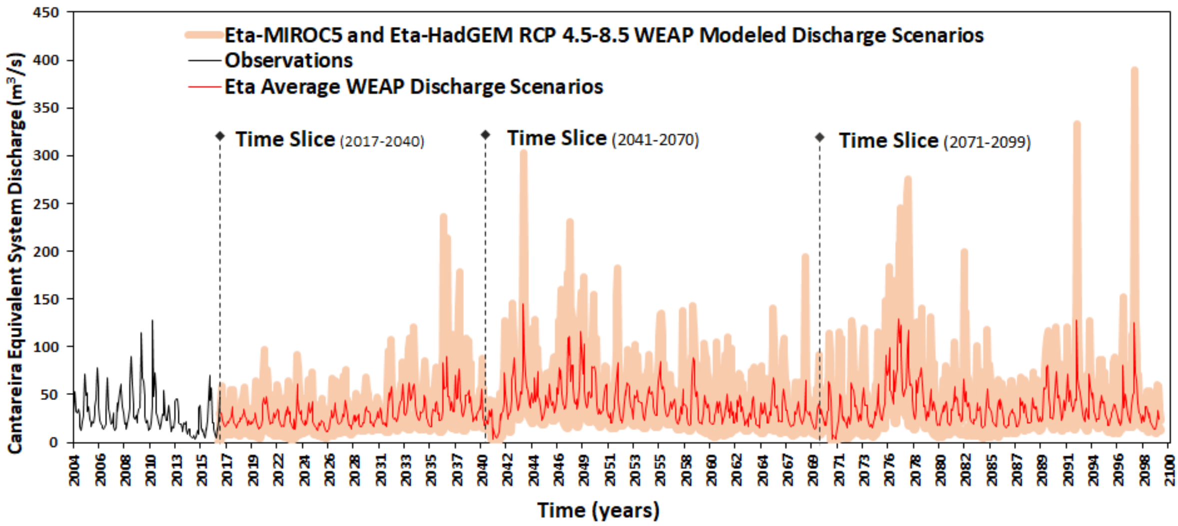

Figure 0-1. Discharge projection scenarios modeled in WEAP, driven by RCM Eta-MIROC5 and Eta-HadGEM under RCP 4.5 - 8.5 scenarios.

Section C.

Fit diagnostic plot of Generalized Extreme Value (GEV) distribution.

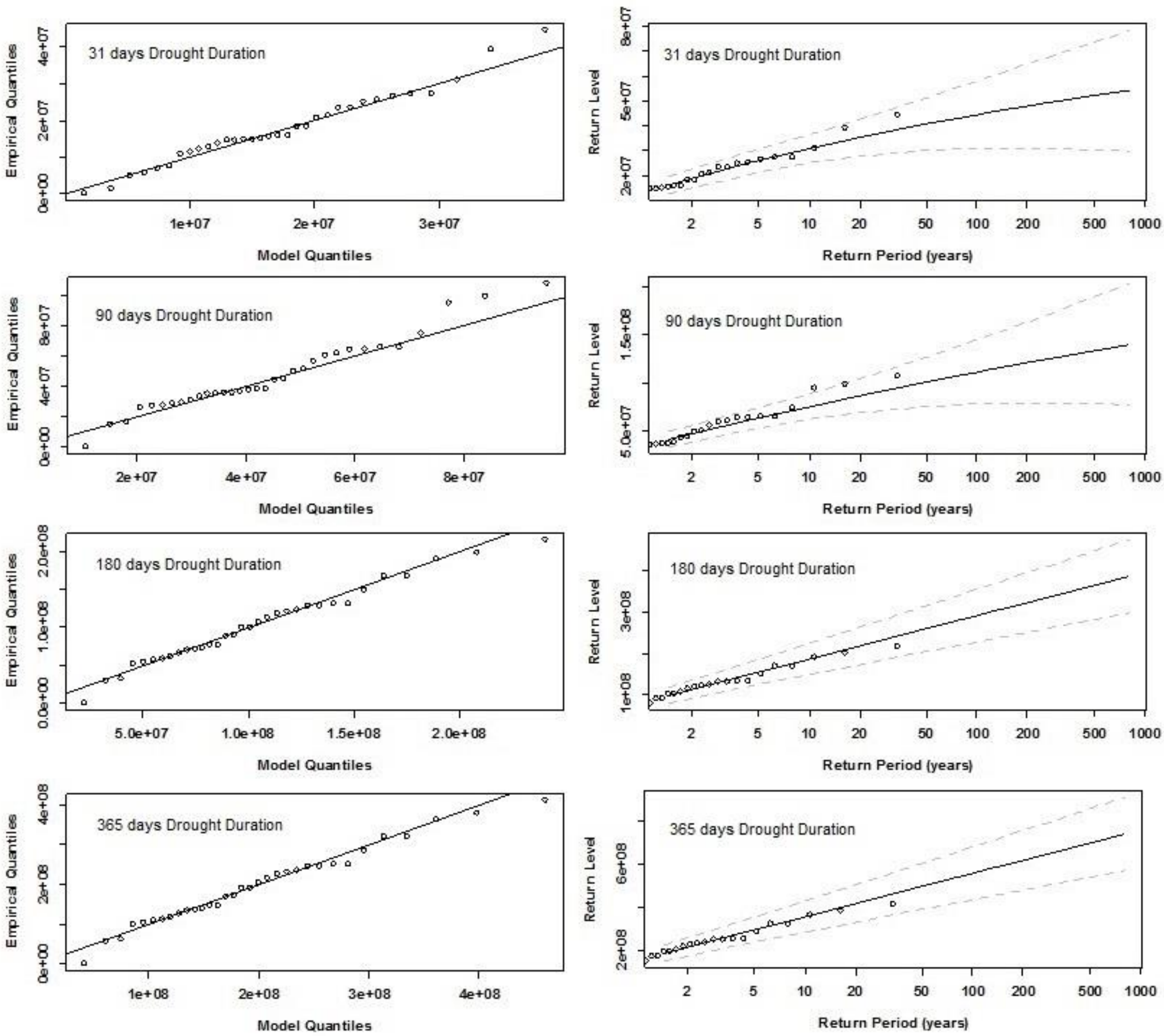

Figure 0-1. Diagnostic plots for stationary GEV model under historical Eta-HadGEM historical scenario and stationarity demand (monthly drought duration intervals): Left panel QQ-plot in [m^3]; Right panel, return level [m^3] vs return period plot.

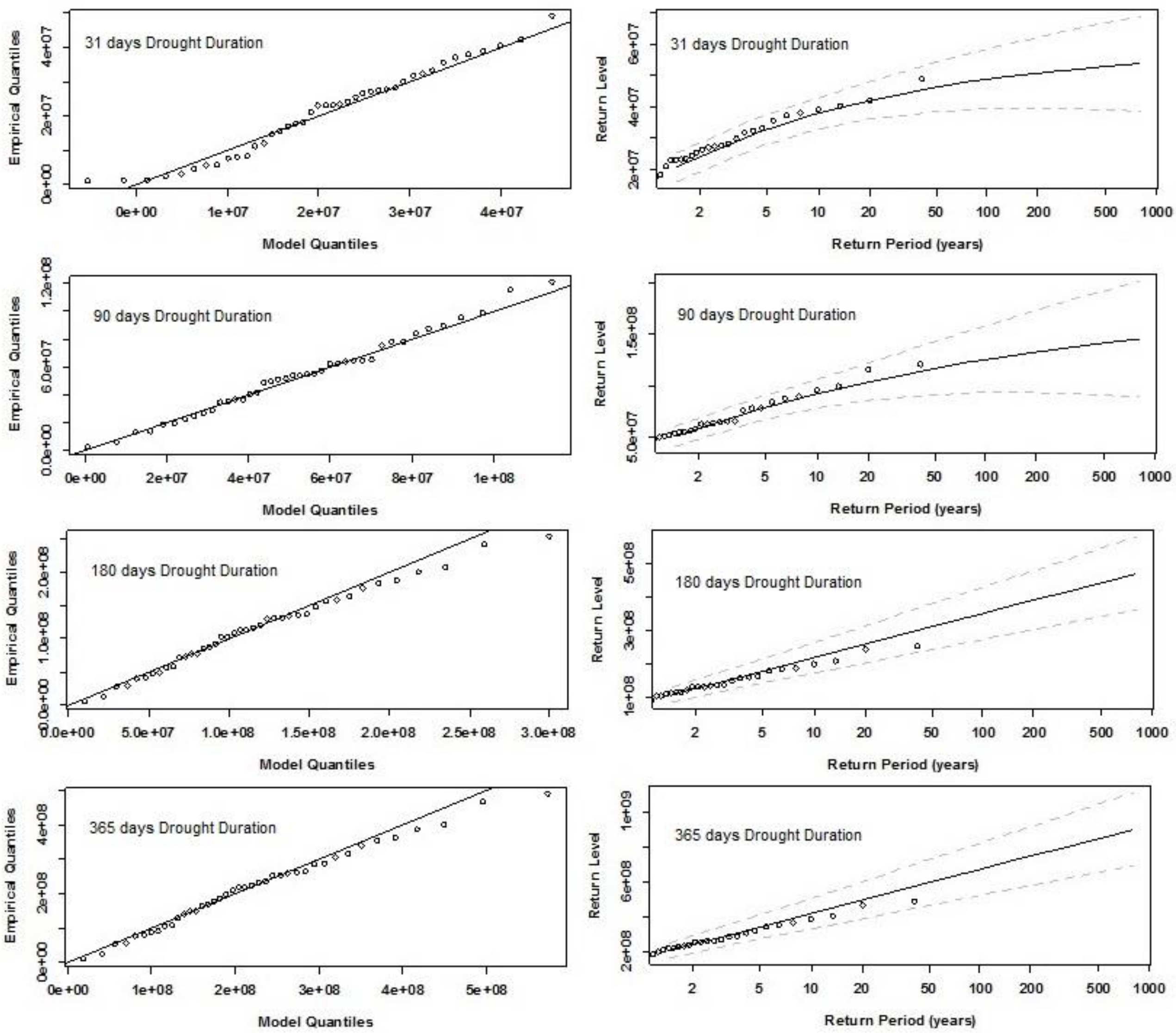

Figure 0-2. Diagnostic plots for stationary GEV model under historical Eta-HadGEM historical scenario and non-stationarity demand (monthly drought duration intervals): Left panel QQ-plot [m^3]; Right panel [m^3], return level vs return period plot.

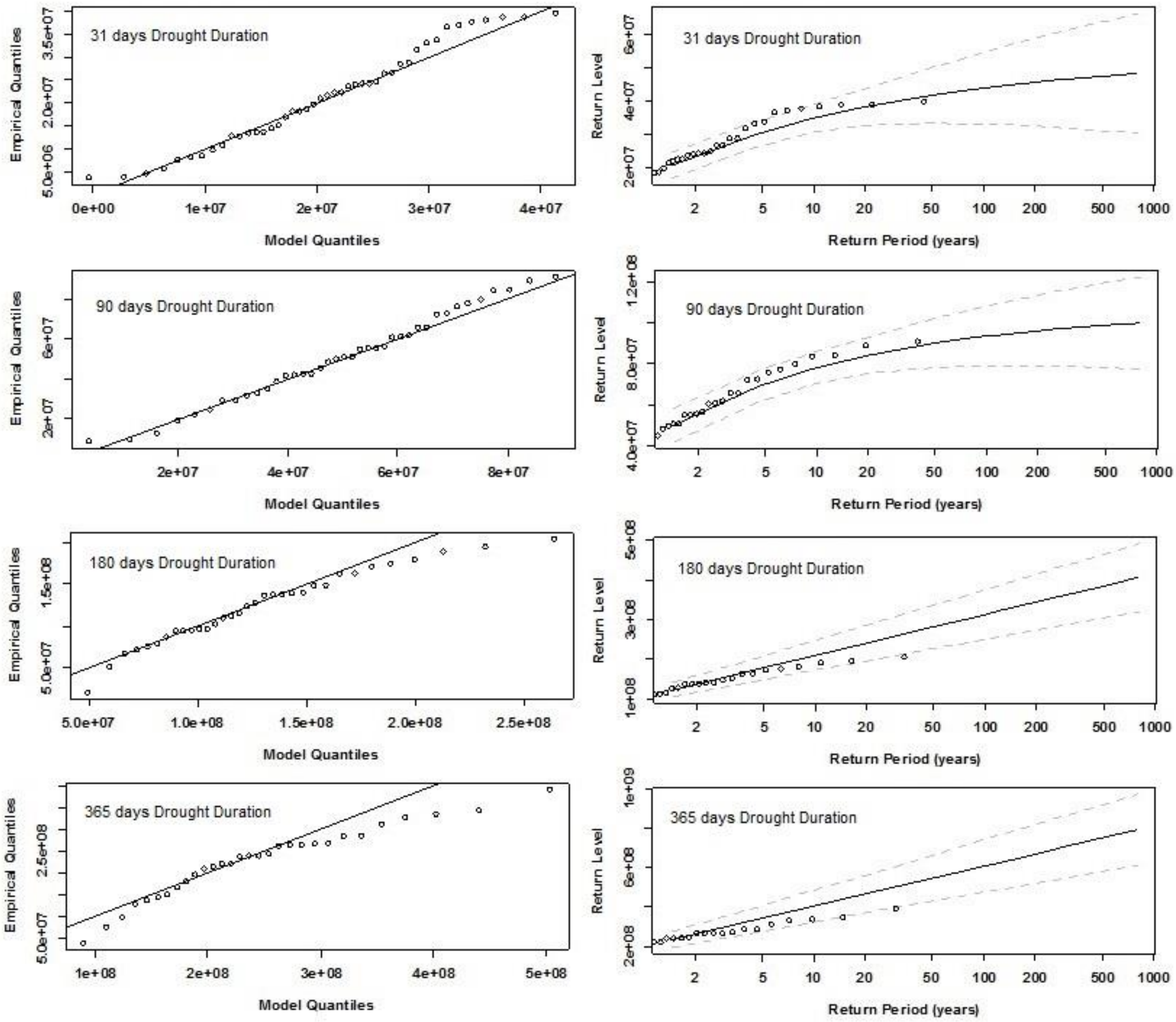

Figure 0-3. Diagnostic plots for stationary GEV model under historical Eta-MIROC5 historical scenario and stationarity demand (monthly drought duration intervals): Left panel QQ-plot [m^3]; Right panel, return level [m^3] vs return period plot.

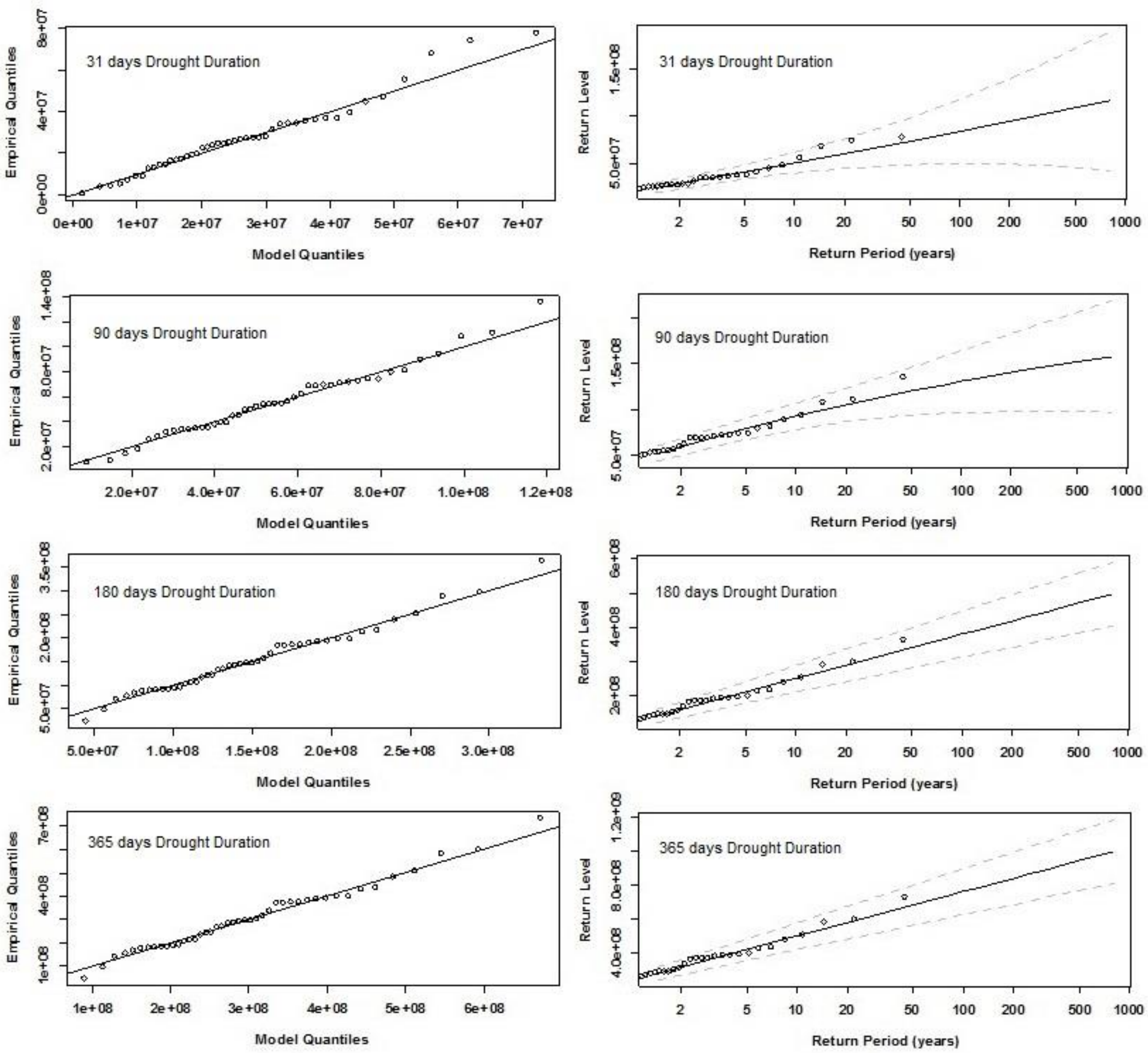

Figure 0-4. Diagnostic plots for stationary GEV model under historical Eta-MIROC5 historical scenario and non-stationarity demand (monthly drought duration intervals): Left panel QQ-plot [m^3]; Right panel, return level [m^3] vs return period plot.

Section D.

Table 0-1. Adjusted parameters GEV distribution Adjusted for SDF curve under Eta-MIROC5. Hist.-Stationary Demand scenario.

Drought Duration	EtaMIROC5 Hist. Stationary Demand			Negative Log-Likelihood
	Location (μ)	Scale (σ)	Shape (ξ)	
31 days	1.69E+07	1.06E+07	-2.88E-01	773.50
90 days	4.25E+07	2.29E+07	-3.67E-01	714.02
180 days	1.06E+08	4.48E+07	0.00E+00	629.90
365 days	2.00E+08	8.86E+07	0.00E+00	592.68

Table 0-2. Adjusted parameters GEV distribution Adjusted for SDF curve under Eta-MIROC5. Hist.-Non-Stationary Demand scenario.

Drought Duration	EtaMIROC5 Hist. Non-Stationary Demand			Negative Log-Likelihood
	Location (μ)	Scale (σ)	Shape (ξ)	
31 days	1.90E+07	1.33E+07	2.74E-02	791.25
90 days	4.36E+07	2.40E+07	-1.07E-01	813.71
180 days	1.20E+08	5.62E+07	0.00E+00	853.50
365 days	2.42E+08	1.13E+08	0.00E+00	884.40

Table 0-3. Adjusted parameters GEV distribution Adjusted for SDF curve under Eta-HadGEM. Hist.-Stationary Demand scenario.

Drought Duration	EtaHADGEM-ES Hist. Stationary Demand			Negative Log-Likelihood
	Location (μ)	Scale (σ)	Shape (ξ)	
31 days	1.33E+07	8.64E+06	-1.10E-01	576.79
90 days	3.53E+07	1.88E+07	-5.54E-02	605.61
180 days	8.00E+07	4.56E+07	0.00E+00	631.75
365 days	1.53E+08	8.73E+07	0.00E+00	653.16

Table 0-4. Adjusted parameters GEV distribution Adjusted for SDF curve under Eta-HadGEM. Hist.-Non-Stationary Demand scenario.

Drought Duration	EtaHADGEM-ES Hist. Non-Stationary Demand			Negative Log-Likelihood
	Location (μ)	Scale (σ)	Shape (ξ)	
31 days	1.62E+07	1.32E+07	-3.04E-01	728.85
90 days	4.13E+07	2.71E+07	-1.84E-01	761.14
180 days	8.63E+07	5.73E+07	0.00E+00	792.70
365 days	1.65E+08	1.10E+08	0.00E+00	819.49

Section E.

Histogram for the SABESP tariff adjustment data series during the period 2000-2016.

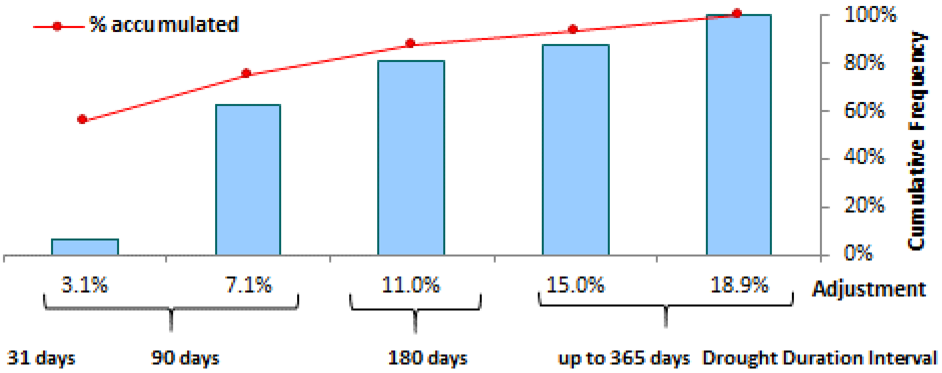

Figure 0-1. Relationship assumptions between Drought duration intervals and water tariff adjustments. Series structure: 16 data in total; first interval 1 frequency, second interval 9 frequencies, third interval 3 frequencies, fourth interval 1 frequency and fifth interval 2 frequencies; average 7.85%, minimum 3.14% and maximum 18.9%.