

Supplementary Material

Assessing reservoir performance under climate change. When is it going to be too late if current water management is not changed?

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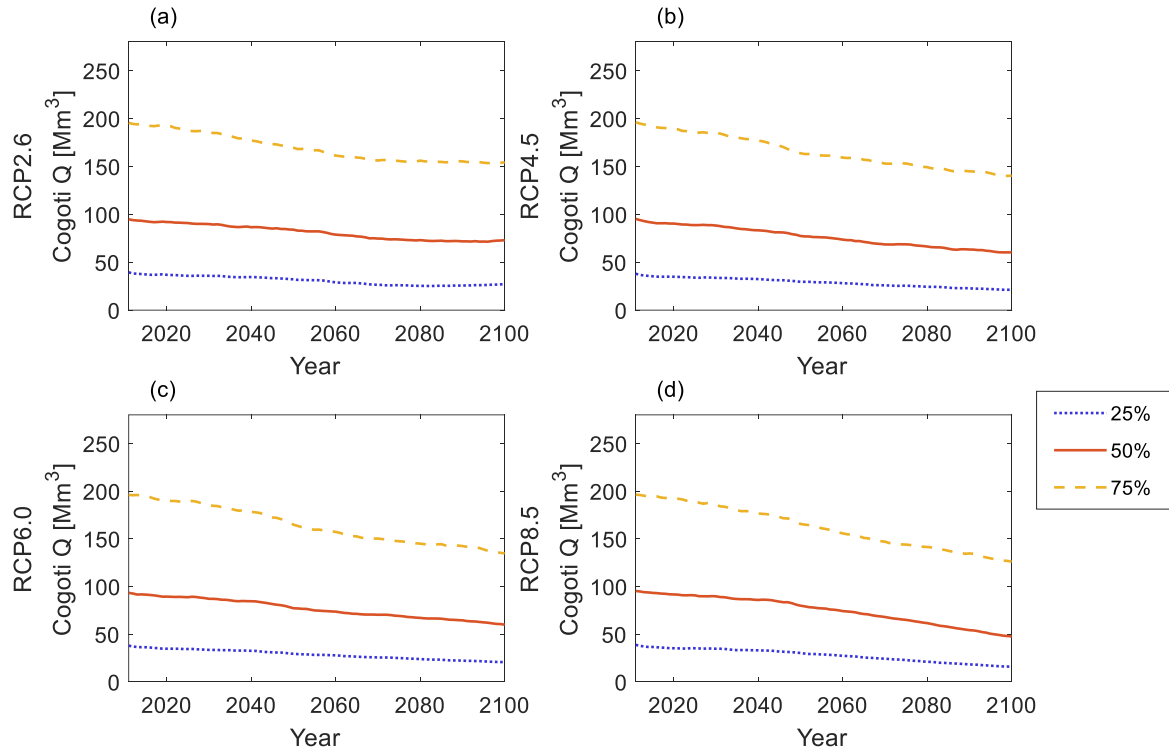


Figure S1. Projected inflow to the Cogotí reservoir under RCP 2.6 (a), 4.5 (b), 6.0 (c) and 8.5 (d). The 25th (dotted line), 50th (solid line) 75th (dashed line) of annual inflows to the Cogotí reservoir are averaged over a 40-year moving window, with the horizontal axis being the last year of the window.

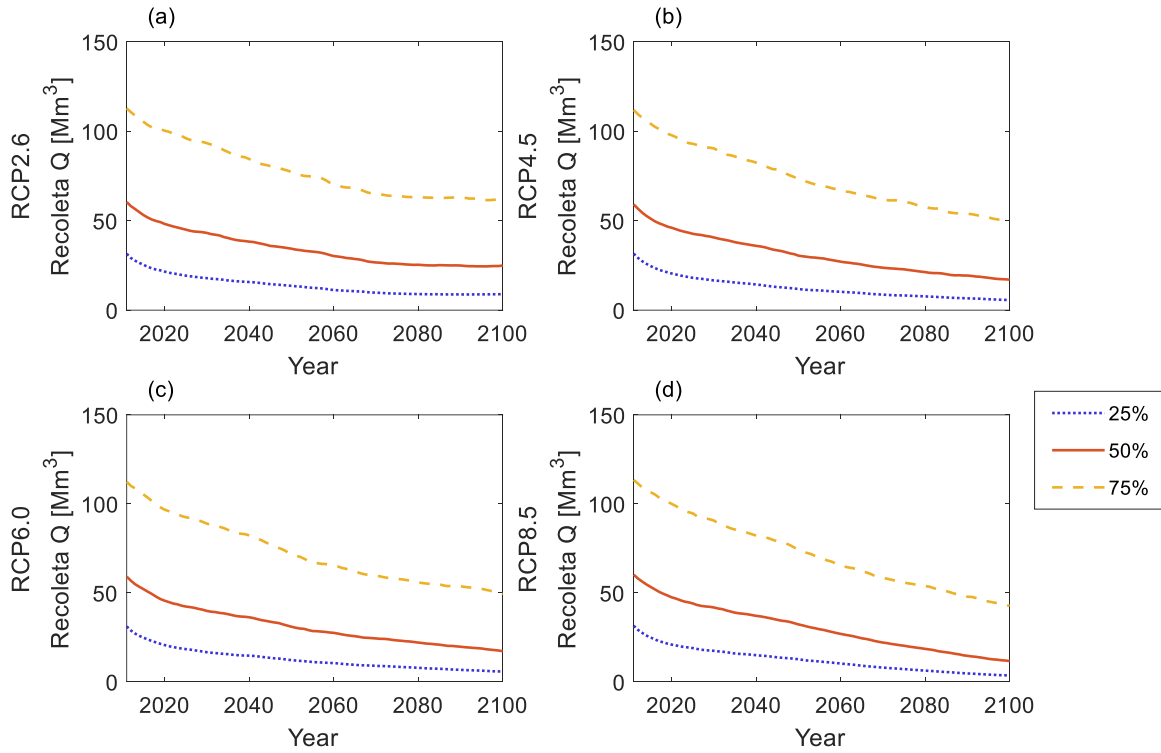
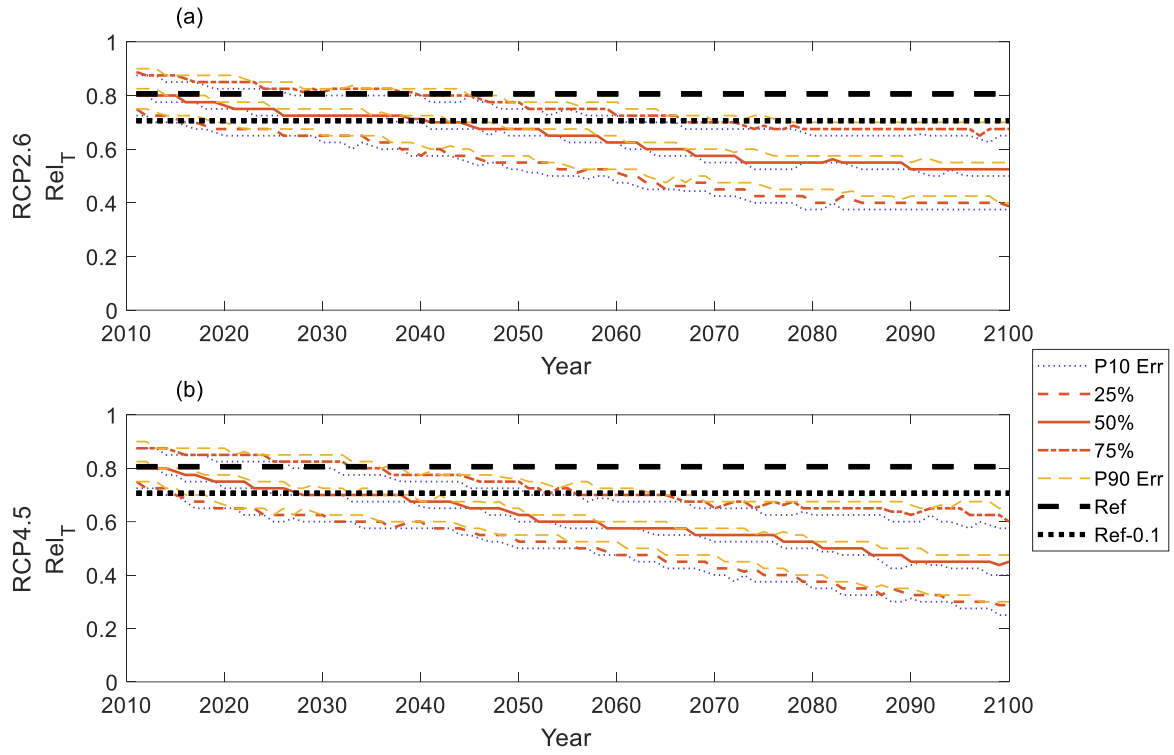


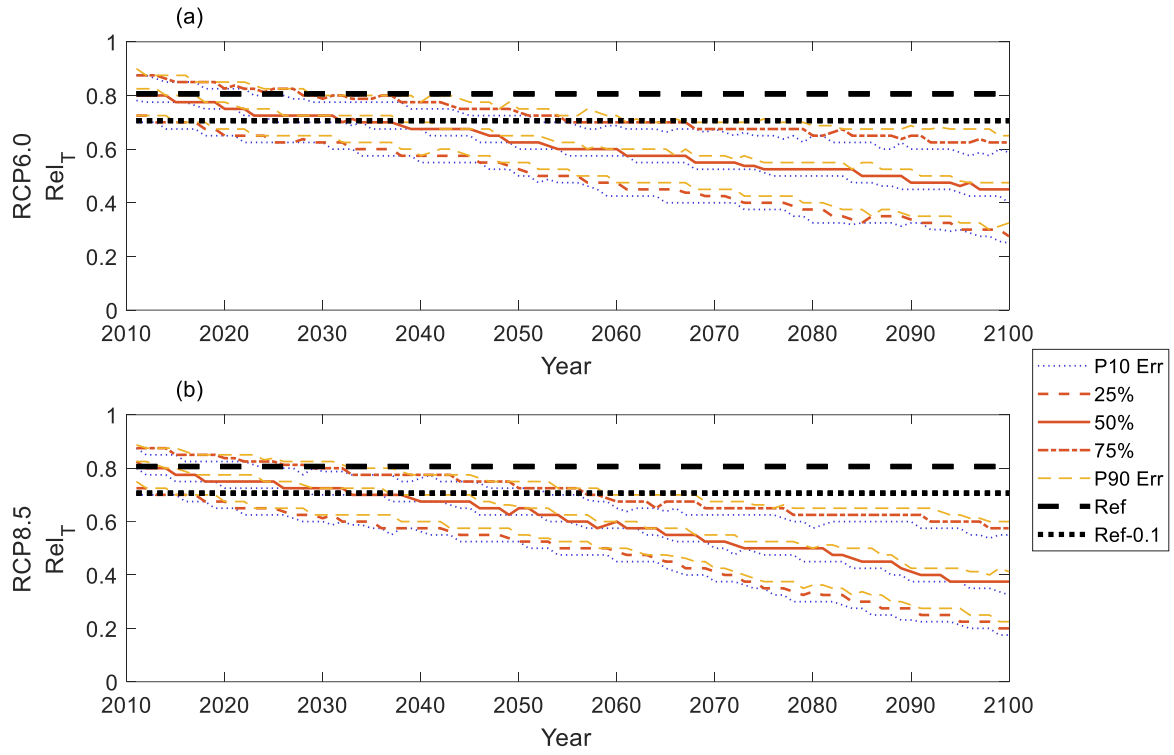
Figure S2. Projected inflow to the Recoleta reservoir under RCP 2.6 (a), 4.5 (b), 6.0 (c) and 8.5 (d). The 25th (dotted line), 50th (solid line) 75th (dashed line) of annual inflows to the Recoleta reservoir are averaged over a 40-year moving window, with the horizontal axis being the last year of the window.

Text S1. Bootstrapping Method

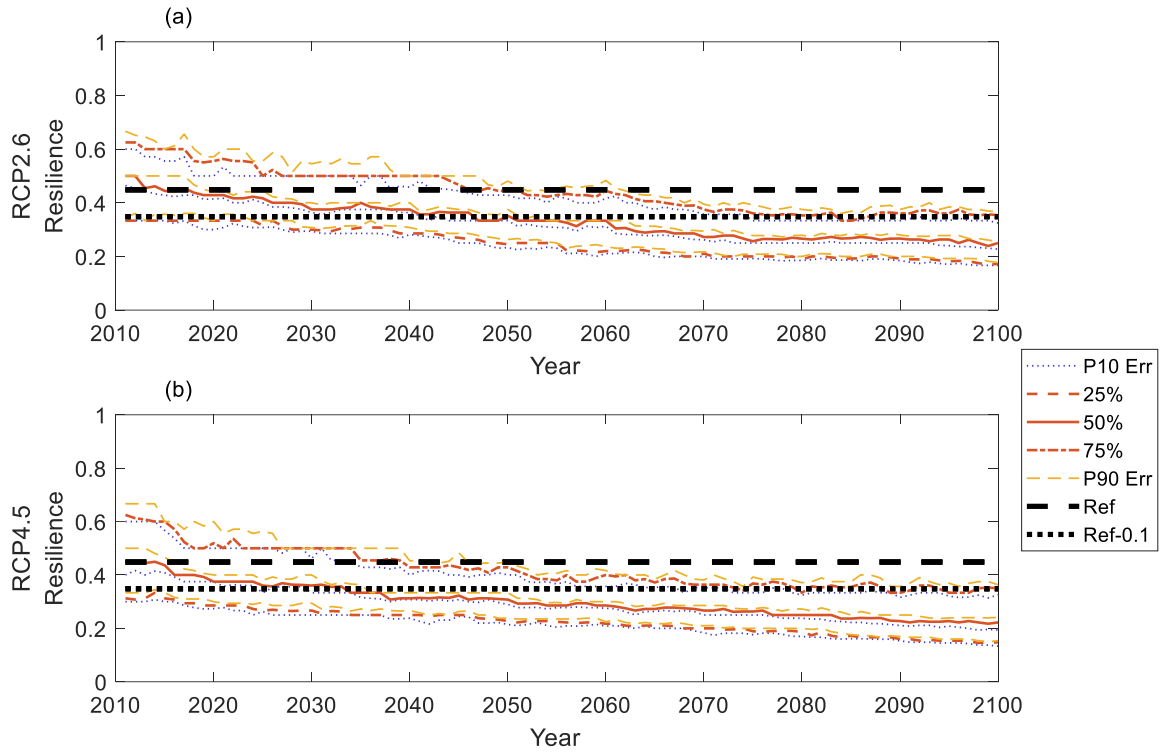
The bootstrapping is used to estimate the potential errors of using only 200 synthetic time series to estimate changes in performance of the Paloma Reservoir System at Limarí. For that purpose, we estimate the same results from Figures 5 to 9 a large number of times (i.e. 1000), by randomly choosing 200 series, allowing repetition, out of the original 200 synthetic time series. The exercise is repeated 1000 times, some of which will correspond to optimistic and pessimistic scenarios, allowing the visualization of the possible error of using only 200 synthetic series. 10th and 90th percentiles out of the 1000 repetitions are presented in Figures S3 to S12.



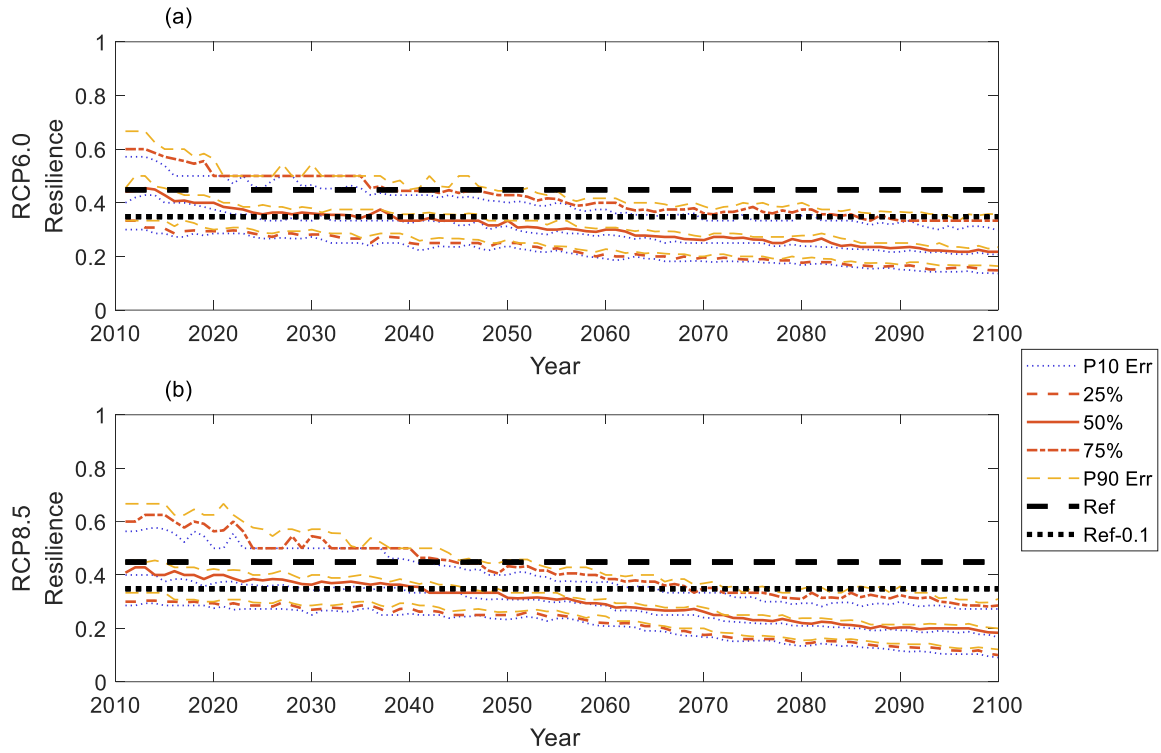
Figures S3. Time-based reliability under RCP 2.6 (a), 4.5 (b), 6.0 (c) and 8.5 (d) for a 40-year moving window, with the horizontal axis being the last year of the window. The thick dashed and dotted lines represent the reference historical performance and 10% worse-than-the-reference value, respectively. The red lines are the same results from Figures 5a and 5b, with the thin blue and yellow lines being the 10% and 90% of error, obtained with the bootstrapping method explained in Text S1.



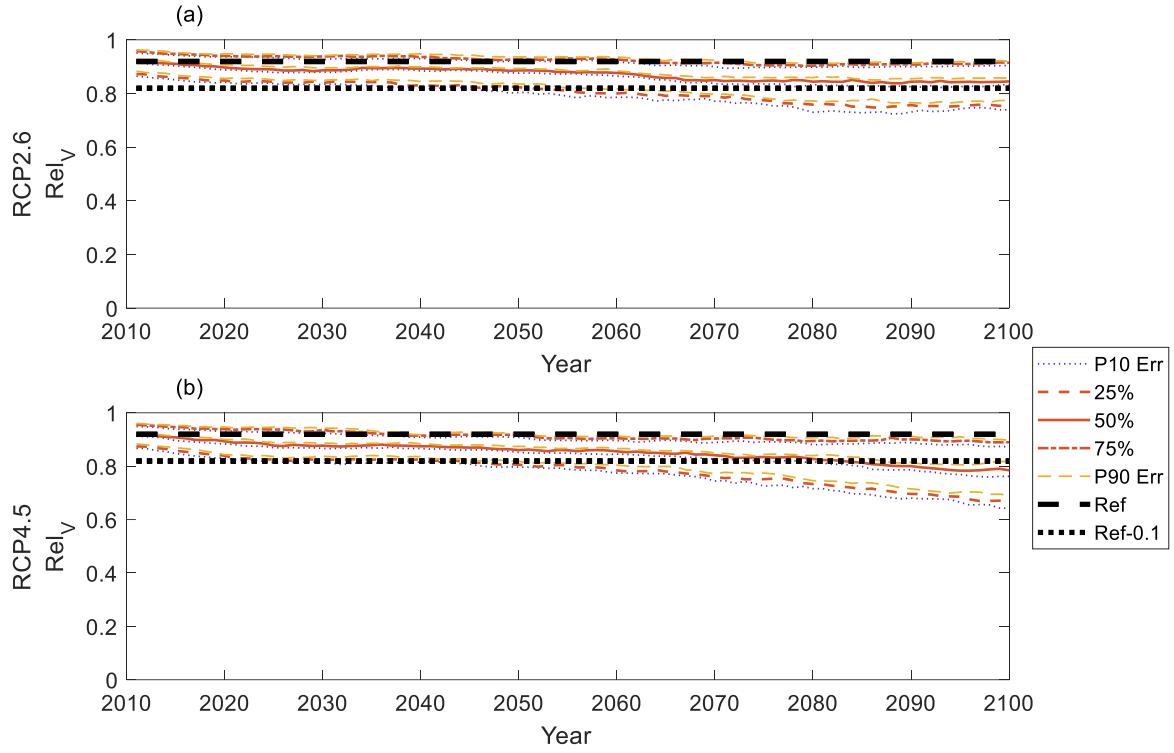
Figures S4. Time-based reliability under RCP 2.6 (a), 4.5 (b), 6.0 (c) and 8.5 (d) for a 40-year moving window, with the horizontal axis being the last year of the window. The thick dashed and dotted lines represent the reference historical performance and 10% worse-than-the-reference value, respectively. The red lines are the same results from Figures 5c and 5d, with the thin blue and yellow lines being the 10% and 90% of error, obtained with the bootstrapping method explained in Text S1.



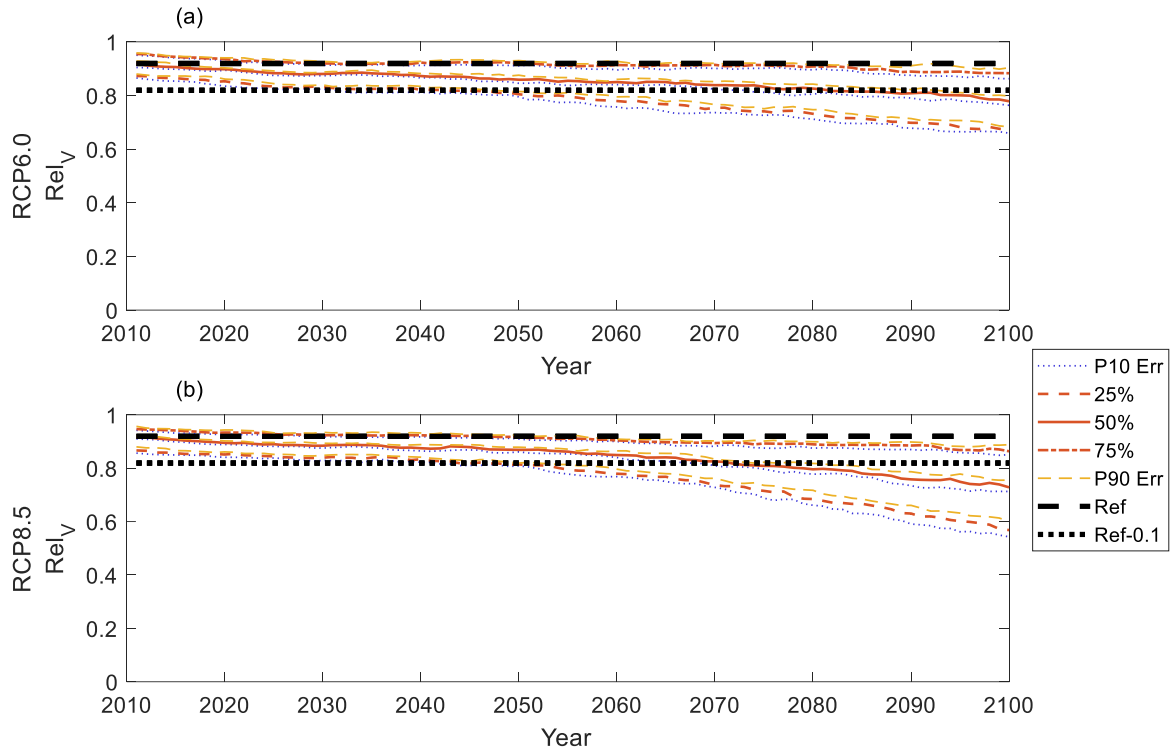
Figures S5. Resilience under RCP 2.6 (a), 4.5 (b), 6.0 (c) and 8.5 (d) for a 40-year moving window, with the horizontal axis being the last year of the window. The thick dashed and dotted lines represent the reference historical performance and 10% worse-than-the-reference value, respectively. The red lines are the same results from Figures 6a and 6b, with the thin blue and yellow lines being the 10% and 90% of error, obtained with the bootstrapping method explained in Text S1.



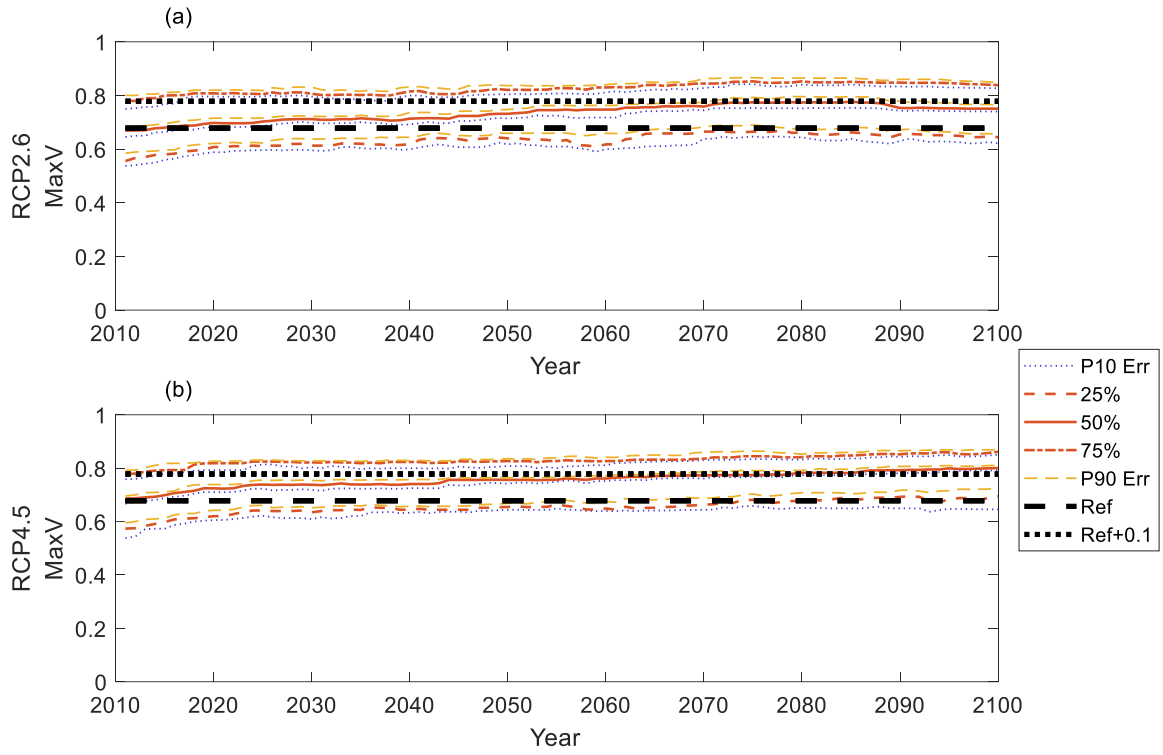
Figures S6. Resilience under RCP 2.6 (a), 4.5 (b), 6.0 (c) and 8.5 (d) for a 40-year moving window, with the horizontal axis being the last year of the window. The thick dashed and dotted lines represent the reference historical performance and 10% worse-than-the-reference value, respectively. The red lines are the same results from Figures 6c and 6d, with the thin blue and yellow lines being the 10% and 90% of error, obtained with the bootstrapping method explained in Text S1.



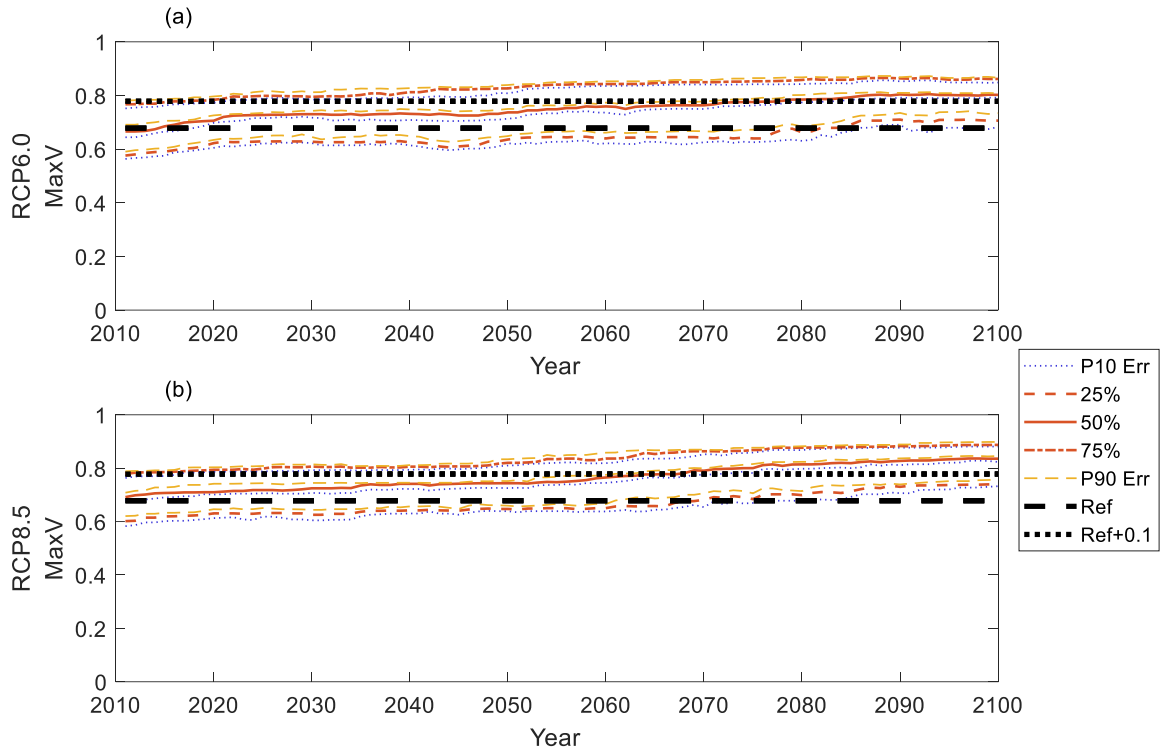
Figures S7. Volume-based reliability under RCP 2.6 (a), 4.5 (b), 6.0 (c) and 8.5 (d) for a 40-year moving window, with the horizontal axis being the last year of the window. The thick dashed and dotted lines represent the reference historical performance and 10% worse-than-the-reference value, respectively. The red lines are the same results from Figures 7a and 7b, with the thin blue and yellow lines being the 10% and 90% of error, obtained with the bootstrapping method explained in Text S1.



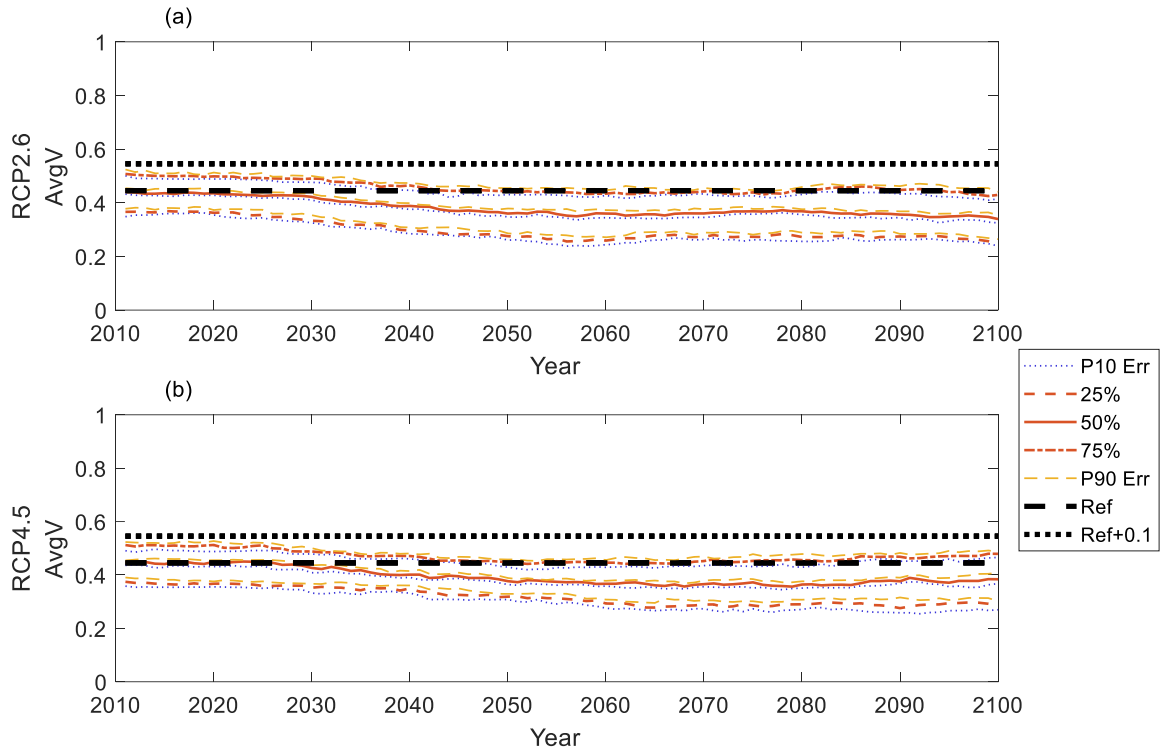
Figures S8. Volume-based reliability under RCP 2.6 (a), 4.5 (b), 6.0 (c) and 8.5 (d) for a 40-year moving window, with the horizontal axis being the last year of the window. The thick dashed and dotted lines represent the reference historical performance and 10% worse-than-the-reference value, respectively. The red lines are the same results from Figures 7c and 7d, with the thin blue and yellow lines being the 10% and 90% of error, obtained with the bootstrapping method explained in Text S1.



Figures S9. Maximum vulnerability under RCP 2.6 (a), 4.5 (b), 6.0 (c) and 8.5 (d) for a 40-year moving window, with the horizontal axis being the last year of the window. The thick dashed and dotted lines represent the reference historical performance and 10% worse-than-the-reference value, respectively. The red lines are the same results from Figures 8a and 8b, with the thin blue and yellow lines being the 10% and 90% of error, obtained with the bootstrapping method explained in Text S1.



Figures S10. Maximum vulnerability under RCP 2.6 (a), 4.5 (b), 6.0 (c) and 8.5 (d) for a 40-year moving window, with the horizontal axis being the last year of the window. The thick dashed and dotted lines represent the reference historical performance and 10% worse-than-the-reference value, respectively. The red lines are the same results from Figures 8a and 8b, with the thin blue and yellow lines being the 10% and 90% of error, obtained with the bootstrapping method explained in Text S1.



Figures S11. Average vulnerability under RCP 2.6 (a), 4.5 (b), 6.0 (c) and 8.5 (d) for a 40-year moving window, with the horizontal axis being the last year of the window. The thick dashed and dotted lines represent the reference historical performance and 10% worse-than-the-reference value, respectively. The red lines are the same results from Figures 9a and 9b, with the thin blue and yellow lines being the 10% and 90% of error, obtained with the bootstrapping method explained in Text S1.

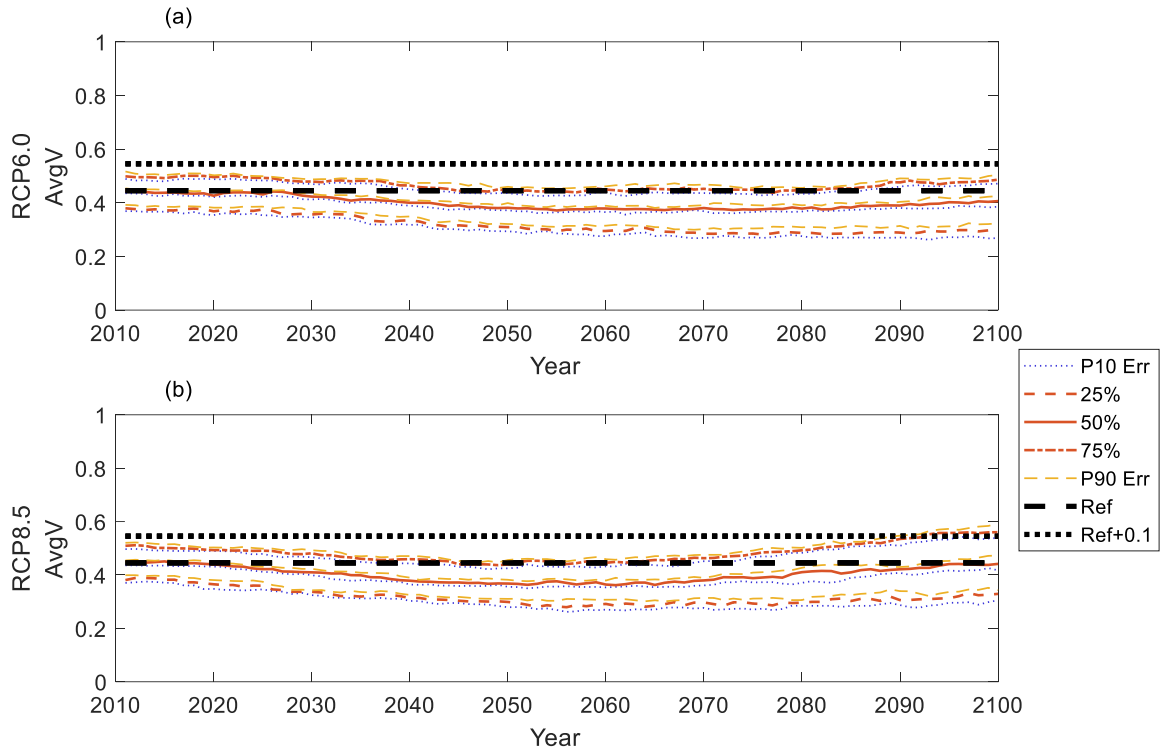


Figure S12. Average vulnerability under RCP 2.6 (a), 4.5 (b), 6.0 (c) and 8.5 (d) for a 40-year moving window, with the horizontal axis being the last year of the window. The thick dashed and dotted lines represent the reference historical performance and 10% worse-than-the-reference value, respectively. The red lines are the same results from Figures 9c and 9d, with the thin blue and yellow lines being the 10% and 90% of error, obtained with the bootstrapping method explained in Text S1.