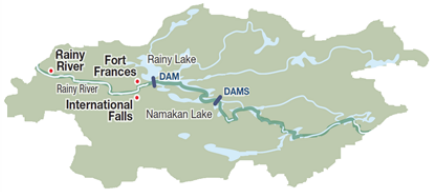
International Rainy and Namakan Lakes Draft Decision Workshop Newsletter



This special newsletter provides a preview of next week's Draft Decision Workshop.

The choices presented to the Study Board

On Tuesday, March 7th, the Study Board will listen to technical evaluations of rule curve alternatives and then engage an audience at the Rainy River Community College Theatre in discussions about those alternatives before outlining the rule curve recommendation they will present in the draft decision document. That report will be circulated for review in April.

The Board has practiced this decision in public before, and over the months, the information available to the Board has improved, including the depth and specificity of the advice from stakeholders and experts. On the basis of all that information and advice, the Technical Working Group (TWG) is providing the Board with evaluations of several rule curve alternatives ***with emphasis on three*** that produce tradeoffs between conflicting objectives that are most consistent with the preferences that have been elicited during practice decision workshops held earlier in the study.

The plans that were evaluated

The three leading alternatives to be presented in greatest detail at the draft decision workshop are:

1. The 2000 Rule Curves
2. Flood Forecast and Damage Reduction
3. Ecological and Flood Forecast and Damage Reduction

The evaluations for some plans that were not evaluated before will be shown and the reasons for not giving them a higher priority explained:

- Two variations on curves shaped to address multiple, sometimes competing ecological requirements. The elevations in these curves are dramatically different from the 2000 Rule Curves but like the 2000 Rule Curves, the same curve is used every year.
- Three variations on interannual variation curves. Natural water levels would vary much more than these lakes have under rule curve regulations. More natural variation would be beneficial for the surrounding ecosystem, but it is difficult to produce natural levels with rule curves. Simulations were done using two sets of three rule curves applied either randomly or using ENSO to forecast whether the inflows would be high or low that year.

- The hybrid plan that kept Namakan higher in the summer a la the 1970 Rule Curves

The evaluations for State of Nature and the 1970 Rule Curves have been shown before, but there is now additional evaluation results from the IERM, and these will also be presented.

Planning simulations versus operational application

Any of these plans would be applied with more variability than modeled. Even with the 2000 Rule Curves, operators have some freedom to choose where in the rule curve band they will target, but the SVM uses the center of the band. The flood forecast is evaluated in the SVM as a hard-coded decision – a fixed algorithm produces a yes/no decision on whether to use the flood curve. In an operational context, there would be a discussion that applied other information, weighed different insights and allowed challenges. The decision would be more nuanced than the algorithm and could produce a yes even when the algorithm result was "no".

The Study Board will discuss the operational context at the Draft Decision workshop because it can change outcomes as certainly as a new rule curves. One aspect that has been discussed before and will be addressed in the Board's report is better communication during key events, including dialogue in setting Spring targets in consideration of flood risks, and communication of water level variability to people who live and work along the River.

More Details on the two leading alternatives to the 2000 Rule Curves

The "Flood Forecast and Damage Reduction" alternative will be familiar to those who have participated in practice decisions or read previous newsletters. It uses a flood forecasting indicator based on ENSO and snowfall; if a flood is indicated, a replacement curve (Figure 1) is used on Rainy Lake. This alternative is like the plan shown in the February webinar broadcast from Ottawa, ON, **but that webinar included a mistaken representation that the forecasting plan damages would be lower than damages would have been under the 1970 Rule Curves.** The mistake was induced during the development of the SVM Light spreadsheet; the damage reduction figures have been corrected for the Draft Decision workshop and show that the 1970 rule curves would reduce damages more than the particular flood forecasting system shown in Figure 1.

The "Ecological and Flood Forecast and Damage Reduction" uses the same flood forecasting mechanism as the "Flood Forecast and Damage Reduction" plan, but when no flood is forecast, it uses a modified rule (Figure 2) that helps support ecosystem health through reduced muskrat mortality.

More Details on the ecological Rule Curves

The ecological rule curves show the potential for using rule curves to restore some of the environmental benefits that would have been available under natural level regulation while still trying to preserve benefits (like the survival of loon nests) that are better with rule curves than natural conditions. Two basic approaches were explored; use the same modified curve every year or create a family of modified curves and use different curves in different years.

Figure 3 shows the basic one year ecosystem curve; a modified version is shown in Figure 4, with the bottom of the band raised to provide greater depths for boating. To avoid the confusion caused by too many lines, only the target levels (rather than the upper and lower bounds) for the interannual plans are shown in Figures 5 and 6. The conflict between natural variability and the benefits of compressing lake levels was considered in the formulation by designing one alternative that stayed closer to the current rule curve range (Figure 6) and another that allowed much greater variation (Figure 5).

Two different ways of determining which interannual rule curve to apply each year were tested. The first approach randomly assigned a rule curve at the beginning of the year, the second assigned a rule curve based on the average departure from normal ENSO temperatures for October, November and December. The high curve was assigned if ENSO was cool, the low curve if ENSO was warm and the middle curve in neutral ENSO years.

The workshop

Detailed results from these plans will be shown at the workshop, after which there will be facilitated and open discussions about the pros and cons of each. The intent is to have the Study Board outline its recommendations for the draft report at the workshop after a thorough public debate. Although all three plans perform well, some are better than others for particular performance indicators, so some tradeoffs will occur no matter which plan is recommended.

The draft report will be subject to the traditional review so the workshop will not be the last opportunity to comment on the Board's recommendations. Technical analysis will continue as the draft report is reviewed, both to confirm the analysis of these plans and to evaluate any refinements.

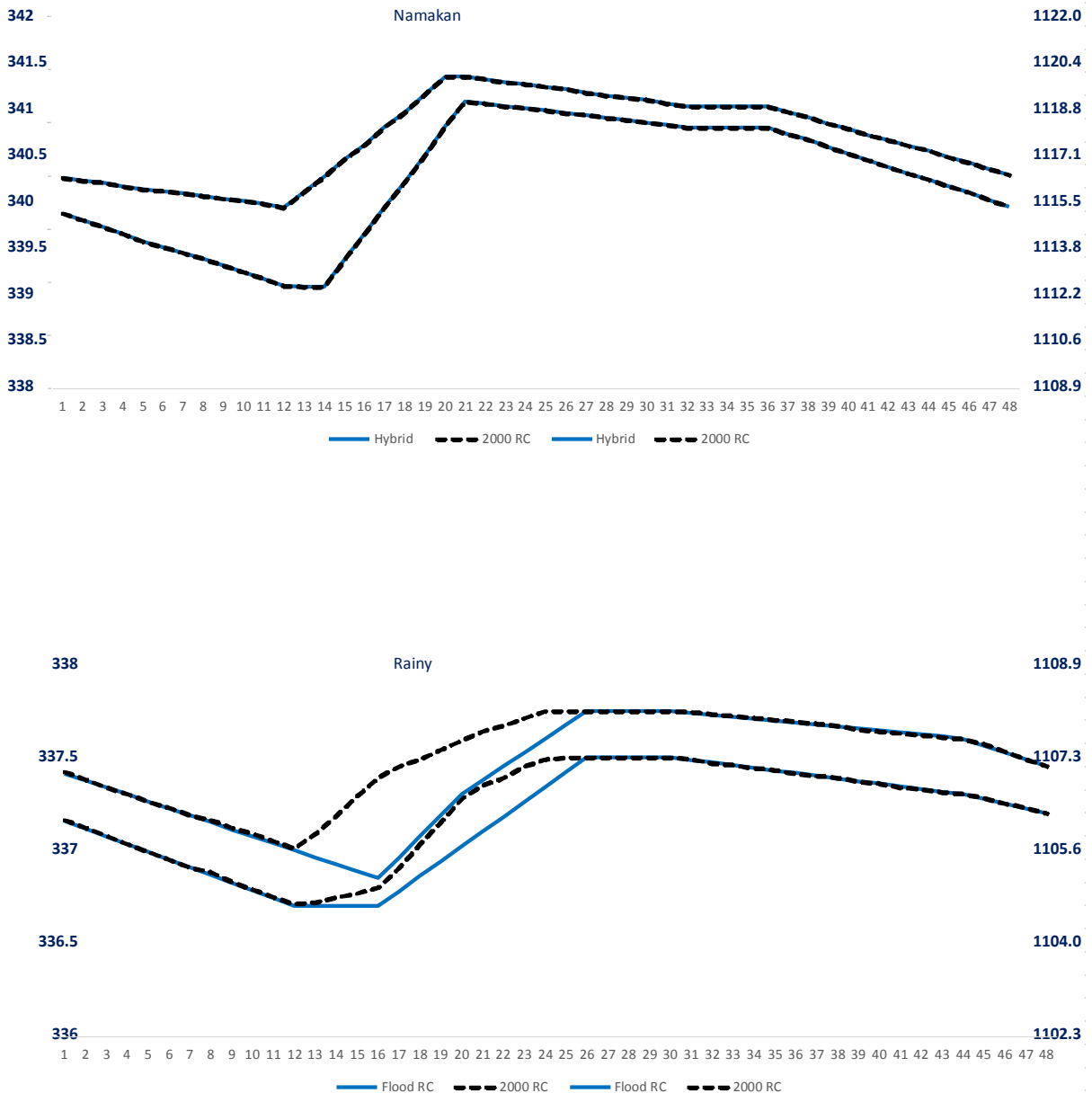


Figure 1 Flood curve (Rainy only) vs. 2000 RC

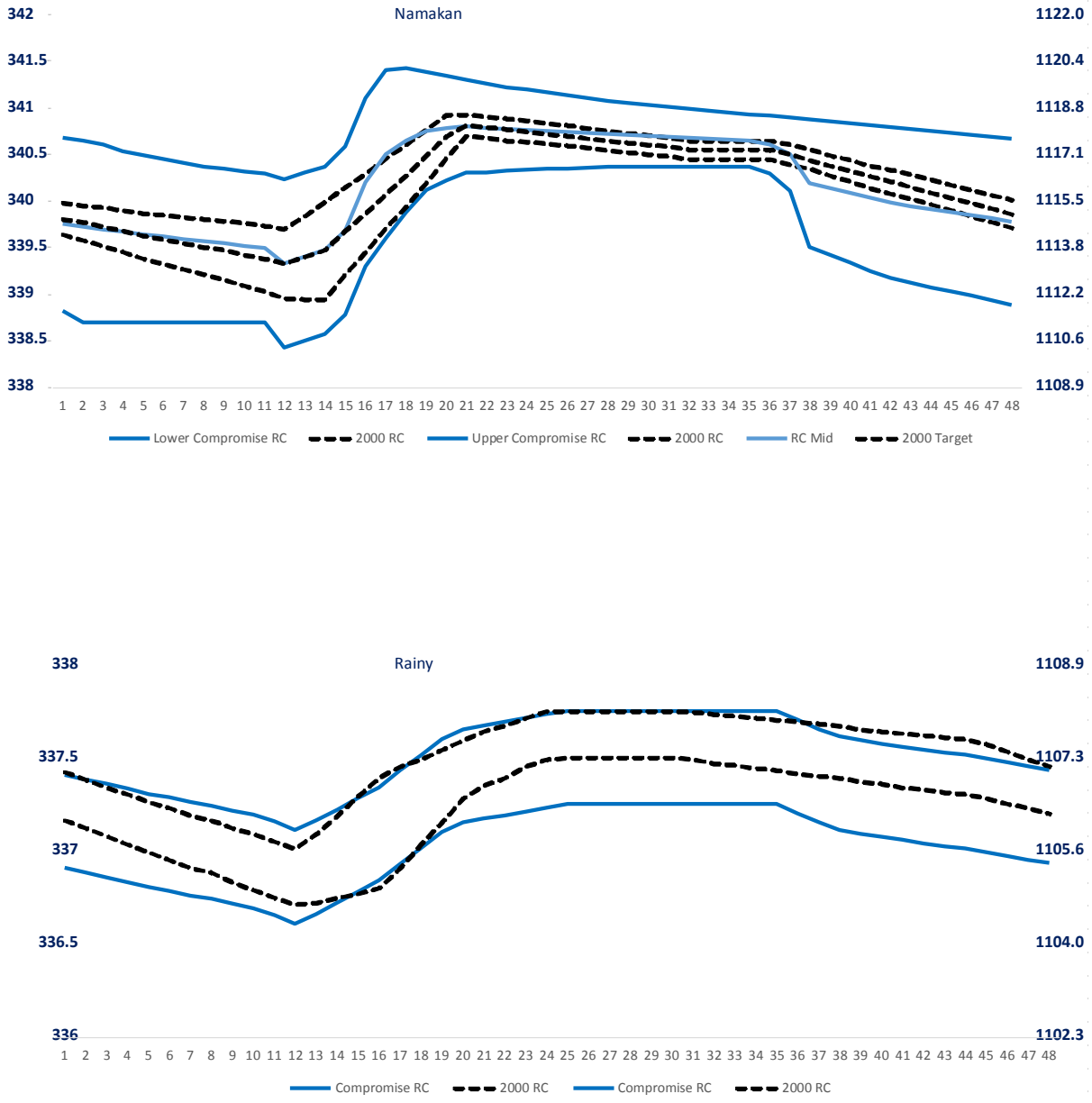


Figure 2 Compromise Ecosystem Rule Curves vs. RC2000

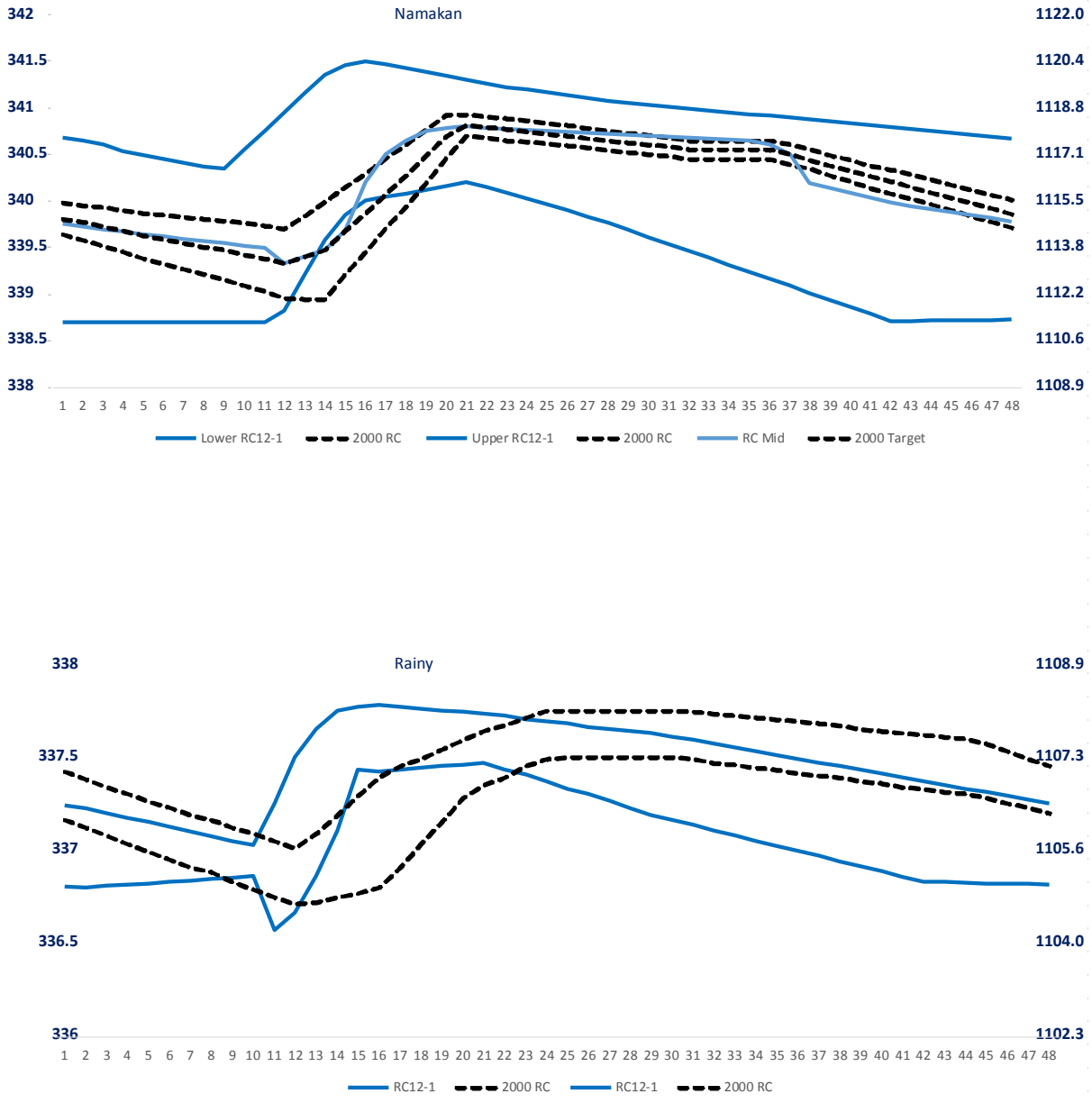


Figure 3 Ecosystem Curves vs. 2000 Rule Curves

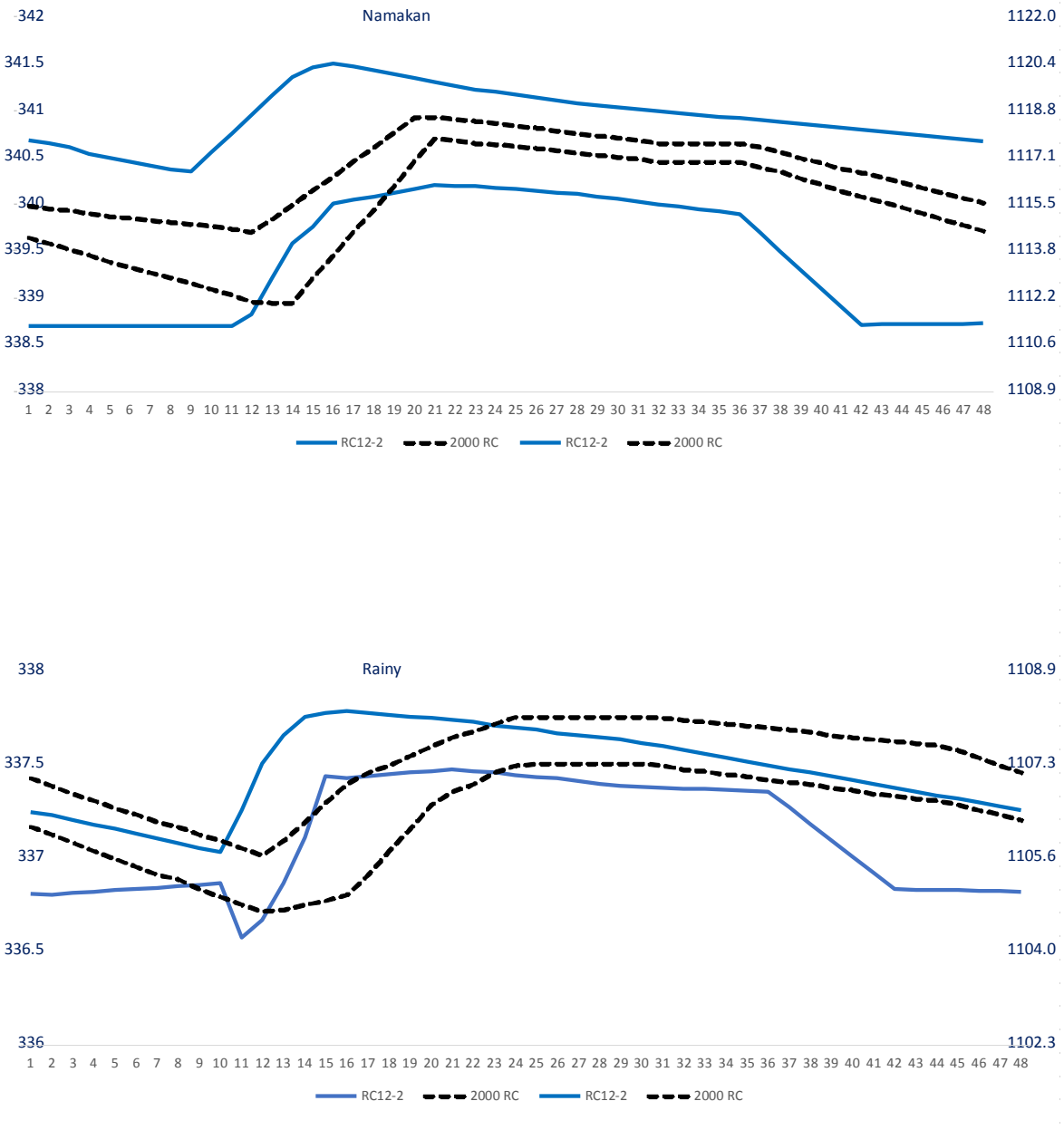


Figure 4 Ecosystem-navigation and 2000 Rule Curves for Namakan and Rainy

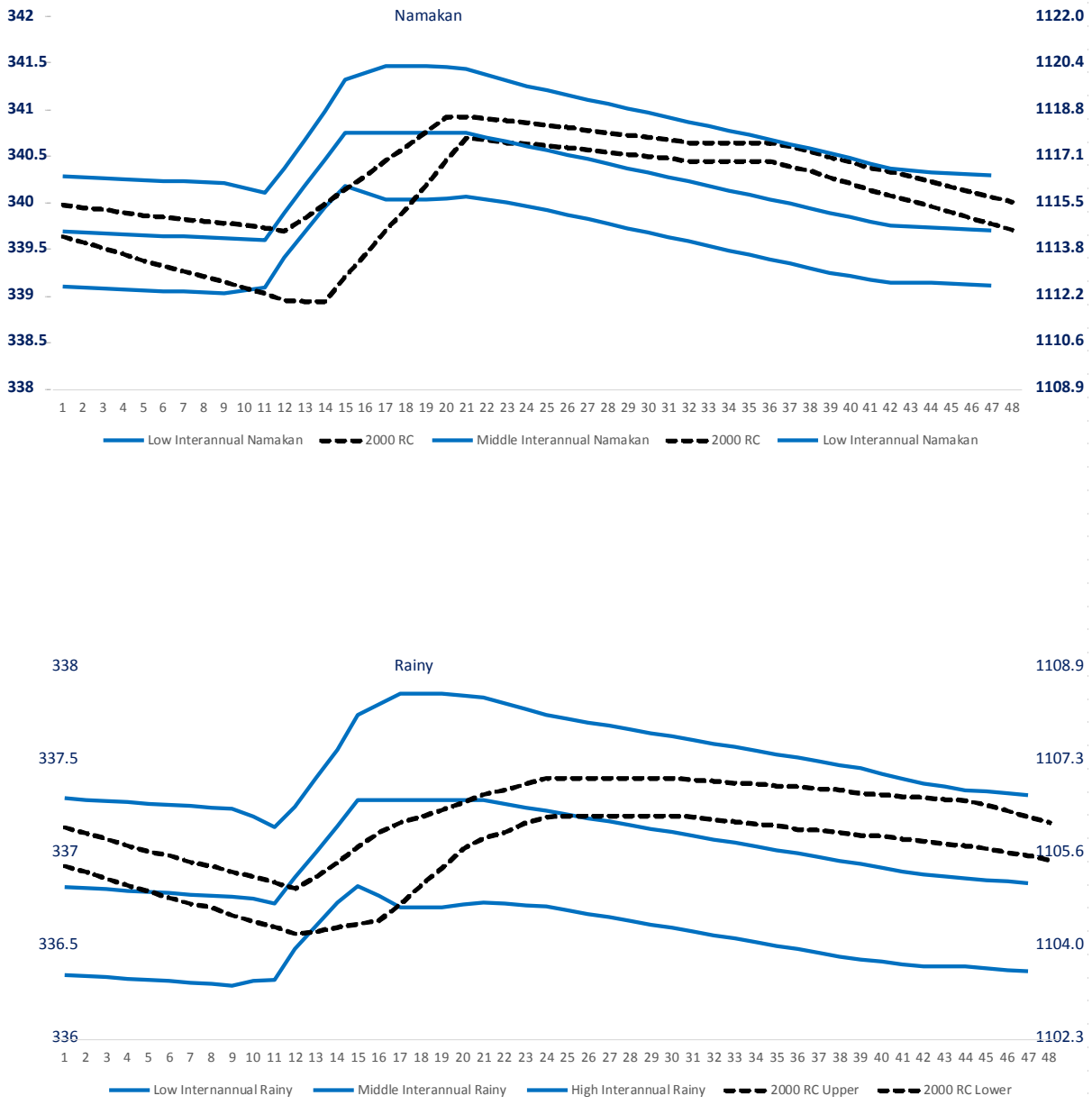


Figure 5 Three Widespread Interannual target levels vs. 2000 Rule Curves for Rainy and Namakan

For clarity's sake, the three target levels used in different years are shown rather than six upper and lower bounds.

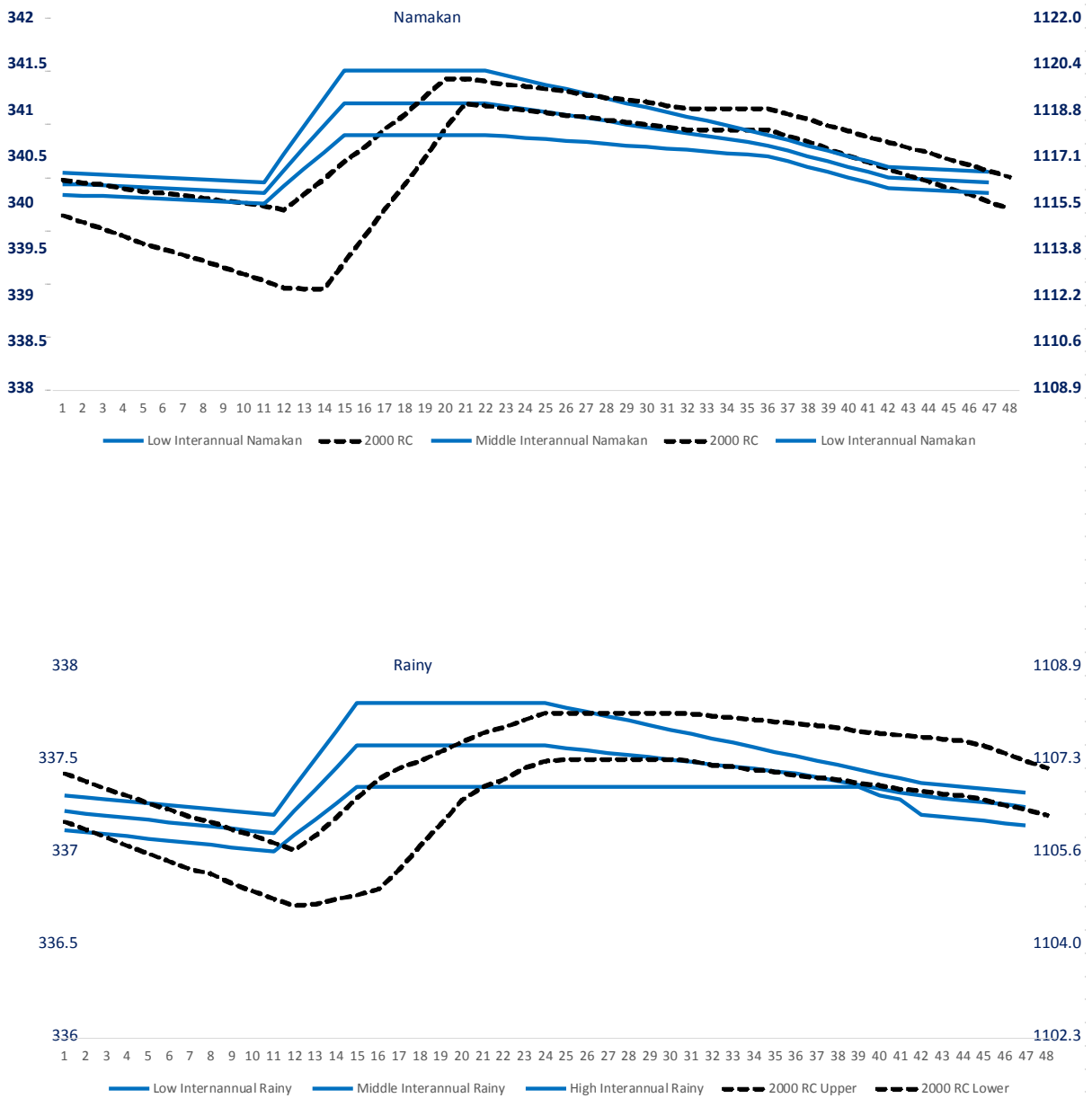


Figure 6 Three narrow spread interannual rule curve targets vs. the 2000 Rule Curve band

For clarity's sake, the three target levels used in different years are shown rather than six upper and lower bounds.