

## PERFORMANCE MEASURE INFORMATION SHEET # 4

### KINBASKET RESERVOIR: EROSION

Objective / Location	Performance Measure	Units	Description	MSIC
Erosion / Kinbasket Reservoir	Erosion Control	# days per year	Sum of # days each year that the reservoir water level is at or above 2470 ft and potentially causing erosion and slumping of the upper elevations	7 days per year

### Description

During the Columbia WUP process, concern was expressed that surcharge of Kinbasket Reservoir may cause erosion from wave action and bank slumping, and affect property and logging roads adjacent to the reservoir. Surcharging may also mobilize debris that has accumulated along the shorelines. The full pool level of the reservoir is 2475 ft (754.38 m), and there are no structures within the surcharge area.

A performance measure was developed during the Columbia WUP process to track the number of days each year that Kinbasket Reservoir elevations would exceed full pool. However, the modelling results suggested the frequency of surcharge on Kinbasket Reservoir is low and unlikely to be affected by proposed operating alternatives being considered by the Committee. For this reason, this performance measure was not carried forward.

### Performance Measure

For the NTS analysis, a similar performance measure was developed to report out on erosion risk under each of the four scenarios being evaluated. This metric tracks the number of days that Kinbasket Reservoir would exceed 2470 ft (753 m). This was considered a more appropriate upper threshold to report against, as the modelling of the NTS scenarios was constrained to avoid surcharge.

### Calculations

For each scenario:

1. Assemble the simulated results for Kinbasket Reservoir elevations over 60 years (1940-2000; Figure 1).
2. Count the number of days over the year that the reservoir is at or above the elevation threshold for each of the 60 years.
3. Summarize all statistics (Figure 2).

### Key Assumptions and Uncertainties

- Each scenario is simulated using the same set of system constraints, input assumptions (e.g., load forecasts) and historic basin inflows (1940 – 2000).

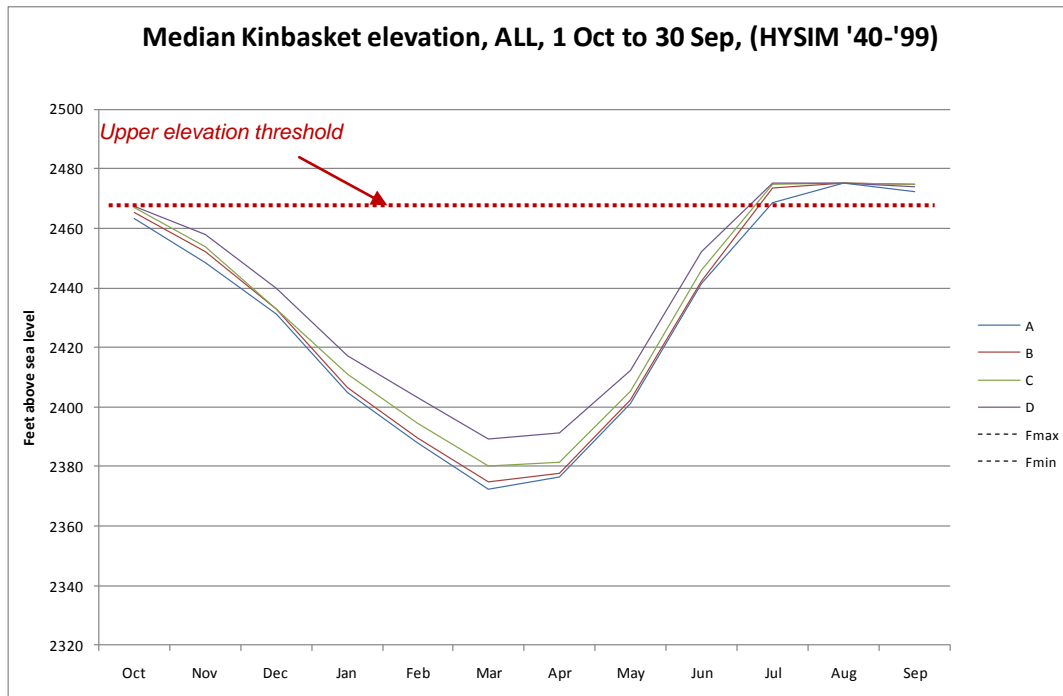


Figure 1. HYSIM Simulated Kinbasket Reservoir elevations. 90<sup>th</sup> percentile over 60 years showing the elevation threshold for erosion.

**Results**

Based on the average and median statistics, Scenario D (no NTS) followed by Scenario C (2.0 MAF) would perform the worst for protection against shoreline erosion in the mid to upper elevations of the drawdown zone. Scenario A would cause reservoir water levels to be lower over significantly greater number days than all of the other three scenarios.

Figure 2. Erosion (>= 2470 ft) – HYSIM Results for all NTS scenarios

