Electricity Risk Curves – Presenting Information

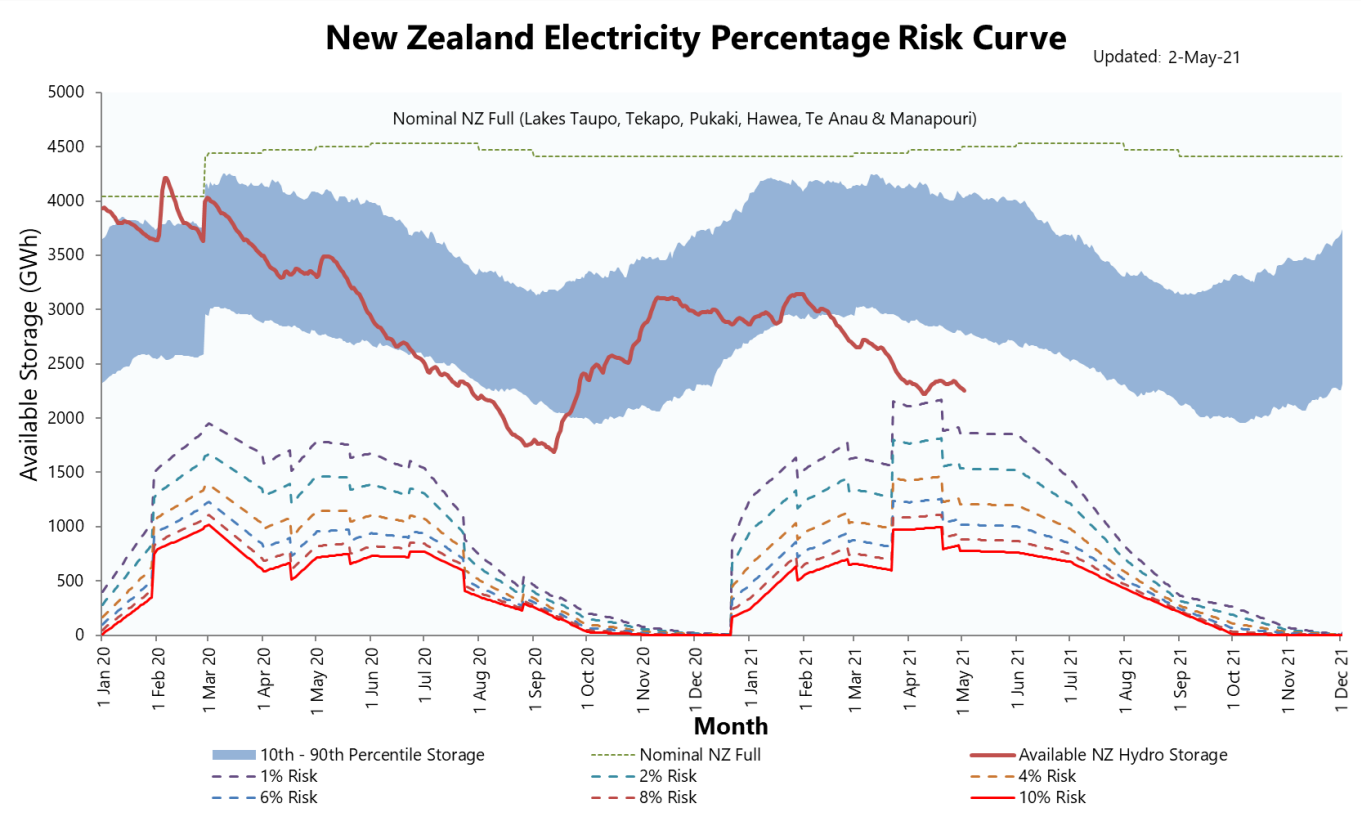
1. Electricity Risk Curves – Percentage Risk

The Electricity Percentage Risk Curves show the estimated risk of our hydro lakes running out of hydro storage. Hydro storage is the volume of water in our hydro lakes that can be used for hydro electricity generation. If there is no hydro storage, then electricity supply shortages are likely.

We publish a chart presenting the 1%, 2%, 4%, 6%, 8% and 10% risk levels. If hydro storage drops to the 1% Electricity Percentage Risk Curve, for example, this means that there is a 1% risk that hydro storage will drop to zero at some point within twelve months based on historic inflow data. The 1% Electricity Percentage Risk Curve therefore also means the level of hydro storage at which approximately 1% of historic inflow sequences will result in hydro storage running down to zero.

Electricity Percentage Risk Curves are used as a key input for other electricity risk curves, discussed below.

For more information on how these Percentage Risk ERCs are modelled, see here.



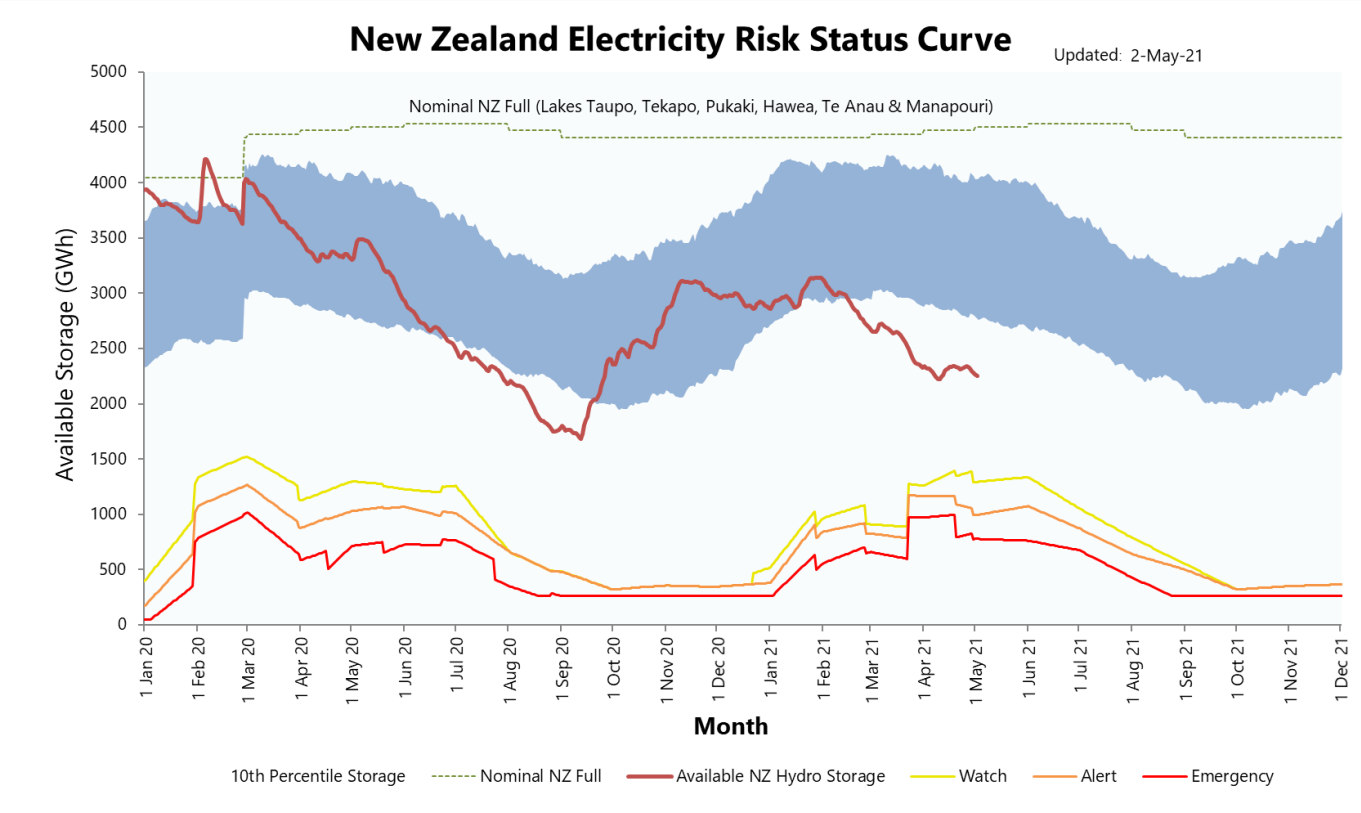
2. Electricity Risk Status Curves

We publish Watch, Alert and Emergency Electricity Risk Status Curves.

The Emergency Risk Status Curve is equal to the 10% risk curve with the addition of floors and a buffer (described below). The 10% curve is significant as when actual storage crosses it and is forecast to remain below it for one week or more, an Official Conservation Campaign (OCC) is initiated.

The Watch and Alert Risk Status Curves are derived from counting back in time to when the 10% curve is expected to be crossed. This approach estimates the future rate of decline in hydro storage, for a scenario where inflows are poor, and from this determines an estimated time until an OCC may be triggered.

The Watch Risk Status Curve shows the levels of hydro storage when we estimate we are within eight weeks from triggering an OCC. Similarly, the Watch Risk Status Curve shows the levels of hydro storage when we estimate we are within three weeks from triggering an OCC.



Time to OCC Approach

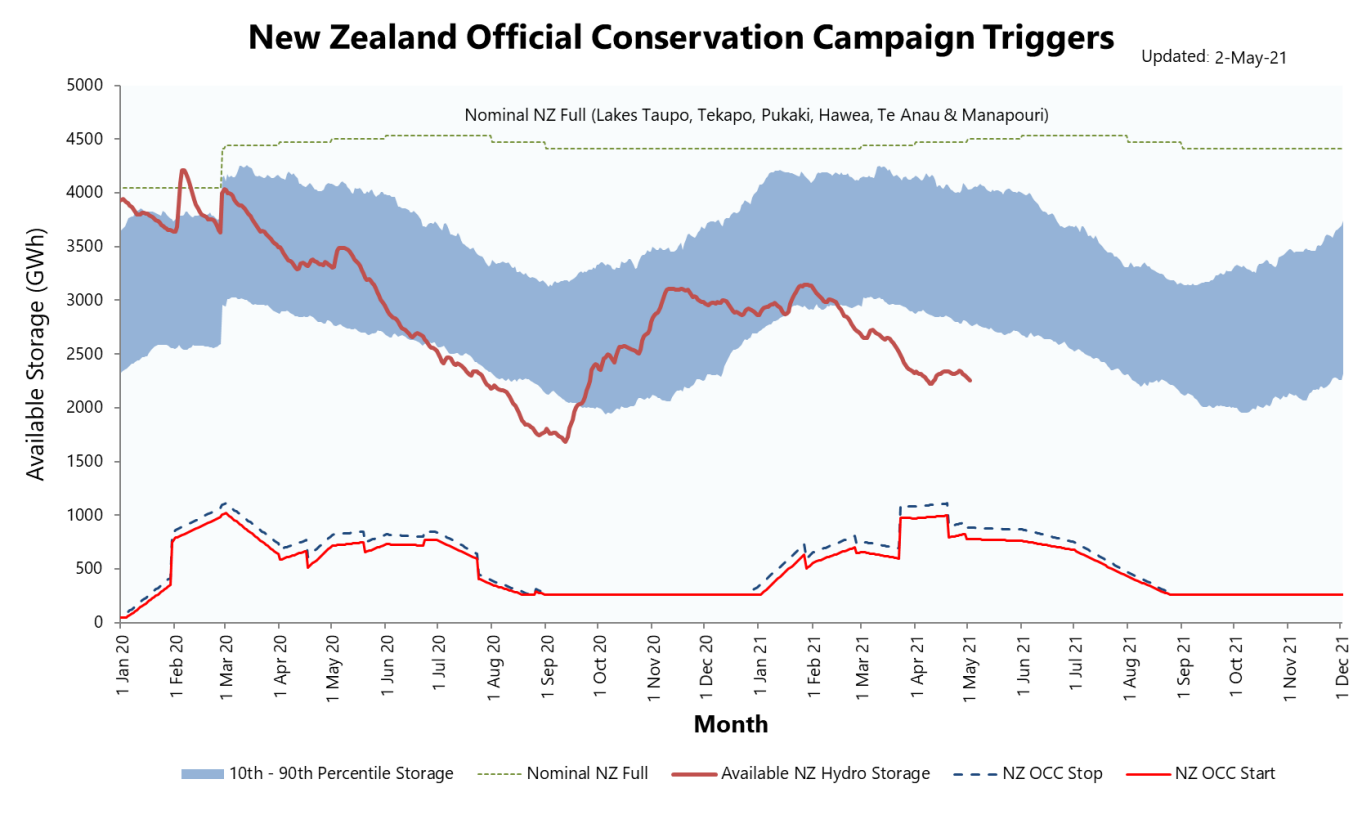
The Time to OCC approach starts by projecting hydro storage out for the next eight weeks, for all available historic inflow sequences, **and** for each month shown in the chart. Hydro storage projections are derived using the same model and assumptions as used for Simulated Storage Trajectories. The Electricity Percentage Risk Curves are derived assuming market behaviour consistent with conserving water. In contrast, the Watch and Alert Risk Status Curves assume market behaviour expected for the calculated hydro storage level. The 1% ERC (with its floor and buffer) is used as the start storage for each month.

For each chart month, the average decline in hydro storage is then found, for the worst 5% of hydro storage projections, over eight weeks, for the Watch curve, and three weeks for the Alert curve. This calculated rate of decline will vary from month to month due to changes in market behaviour and hydro inflows. The Watch and Alert Risk Status Curves are derived by adding the calculated average decline in storage for 3 weeks and 8 weeks onto the Emergency Risk Status Curve.

As Watch and Alert Risk Status Curves are derived using the worst 5% of historic hydro inflow sequences, they represent a 5% chance of an OCC occurring within eight and three weeks respectively. However, due to a correlation between future inflows and inflows in recent weeks, this number should be used with caution as it may be higher.

3. Official Conservation Campaign Triggers Chart

The OCC Triggers chart shows the OCC start and OCC stop curves. These are equal to the 10% and 8% percentage risk curves (with floors and buffer added) respectively. This chart will be used by the System Operator as a trigger to start or end an OCC (An alternative date can be agreed with the Electricity Authority).



4. Contingent Storage Release Boundaries Chart

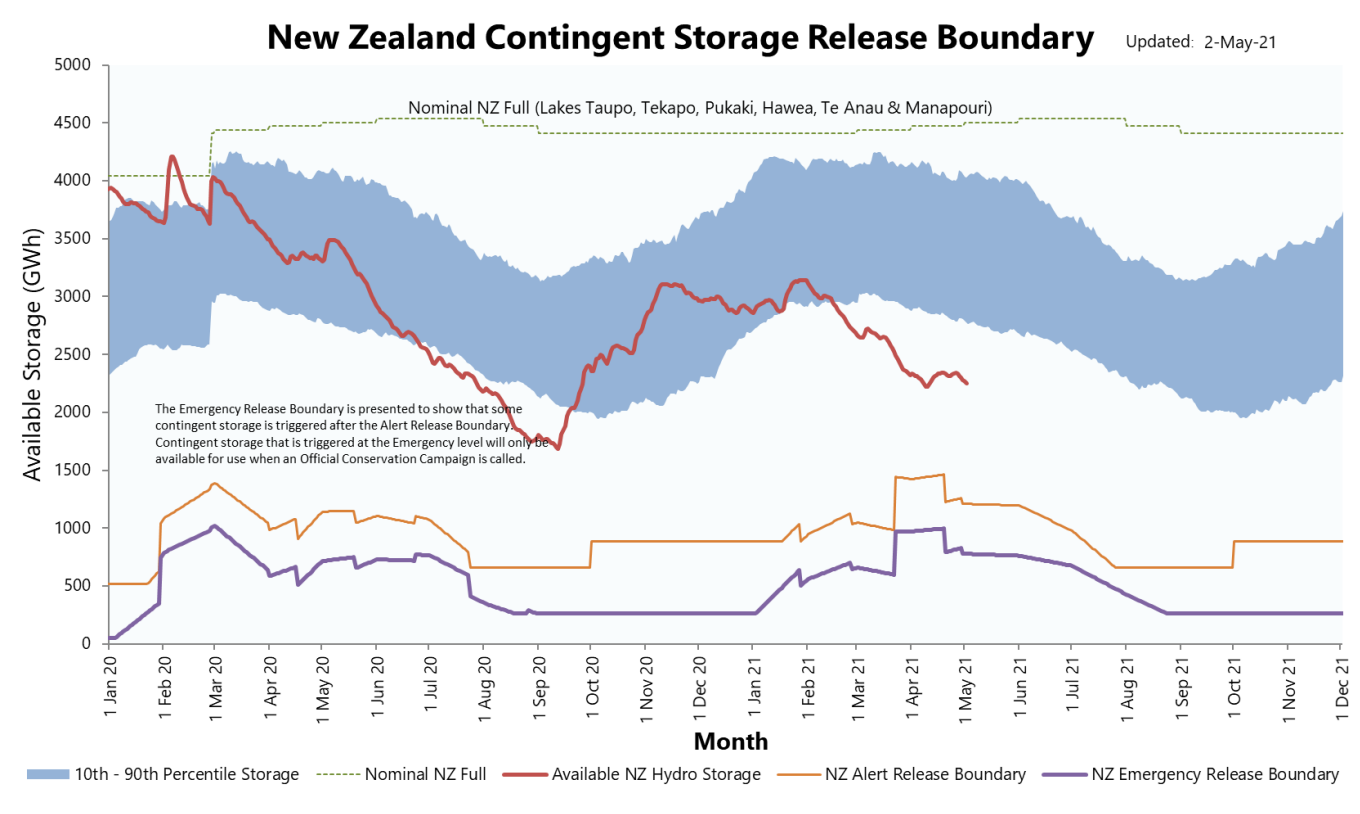
Contingent storage[1] is hydro storage that is only able to be used for hydro electricity generation if hydro storage falls to a Contingent Storage Release Boundary. There are currently two Contingent Storage Release Boundaries for our hydro lakes. The majority of contingent storage becomes available at the Alert Release Boundary and the rest at the Emergency Release Boundary. See Table 1 for a summary of contingent storage.

Table 1. Contingent Storage for NZ Lakes

Lake	Amount of Contingent Storage (GWh)	Condition for Access to Contingent Storage
Hawea	67	Alert Release Boundary
Tekapo	220	Alert Release Boundary (from 1 October to 31 March)
Pukaki	331 214	Alert Release Boundary Emergency Release Boundary

[1] For more on contingent storage and the CSRB chart – see here.

The release boundaries are calculated as the 4% and 10% Electricity Percentage Risk Curves with floor and buffer value added. The Alert Release Boundary was created to keep consistency with historical methods of determining access to contingent storage. The Emergency Release Boundary is identical to the Emergency Risk Status Curve.



Floors and Buffers

Floors and a buffer set minimum hydro storage levels for the Emergency Risk Status Curve, OCC triggers curves, and the Contingent Storage Release Boundaries. Together they are intended to provide a pragmatic minimum level of hydro storage when the estimated risk of running out of water drops to very low levels in the spring and summer months. For more information, see here.