

Waikato River Hydrology Presentation

David Payne



MIGHTY RIVER POWER

Lake Taupo

Waikato Hydro System Catchment

Drought and Flood conditions

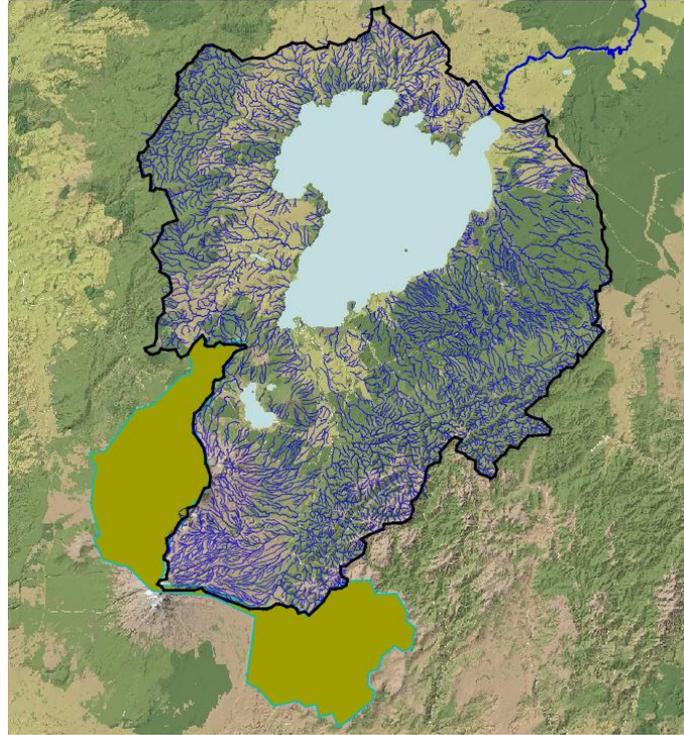
MIGHTY RIVER POWER



Lake Taupo



Lake Taupo catchment



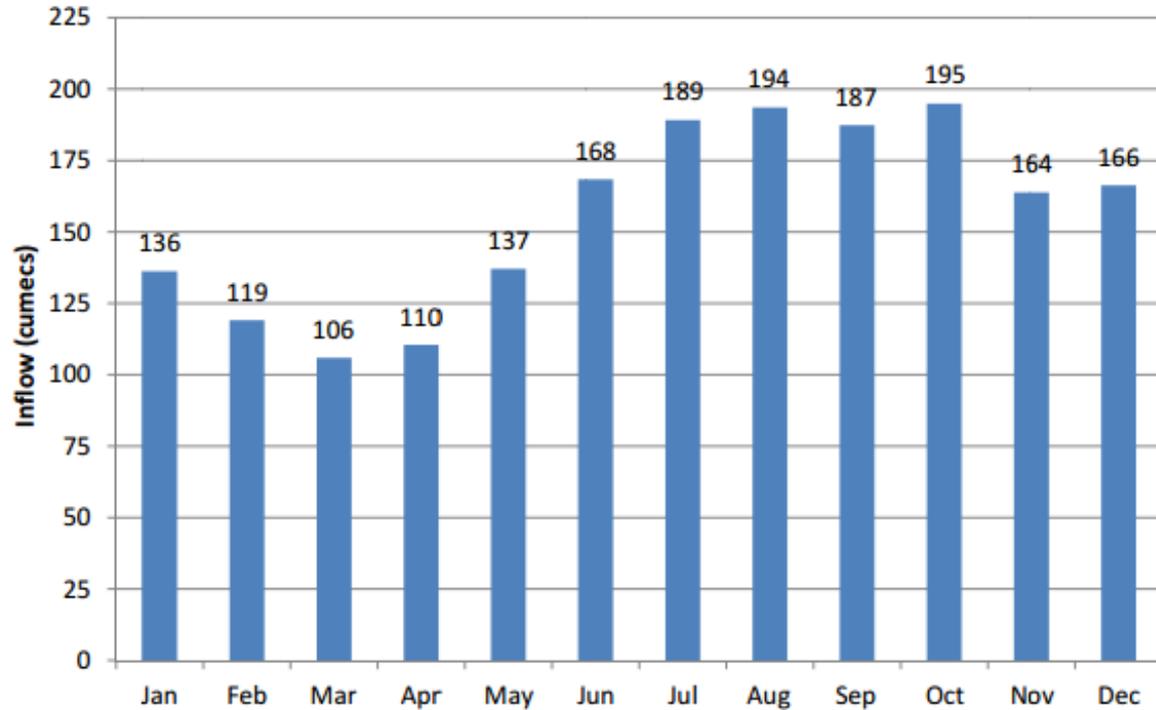


Lake Taupo water level, rainfall and flow stations



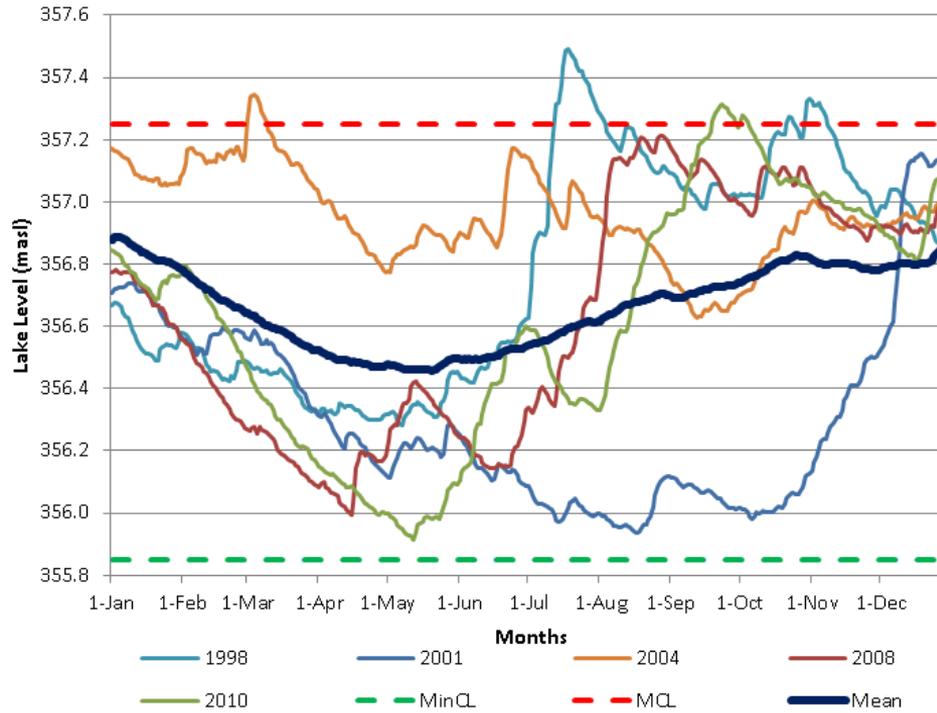


Lake Taupo mean Monthly inflow





Taupo lake level ranges





Top 5 Lake Taupo facts

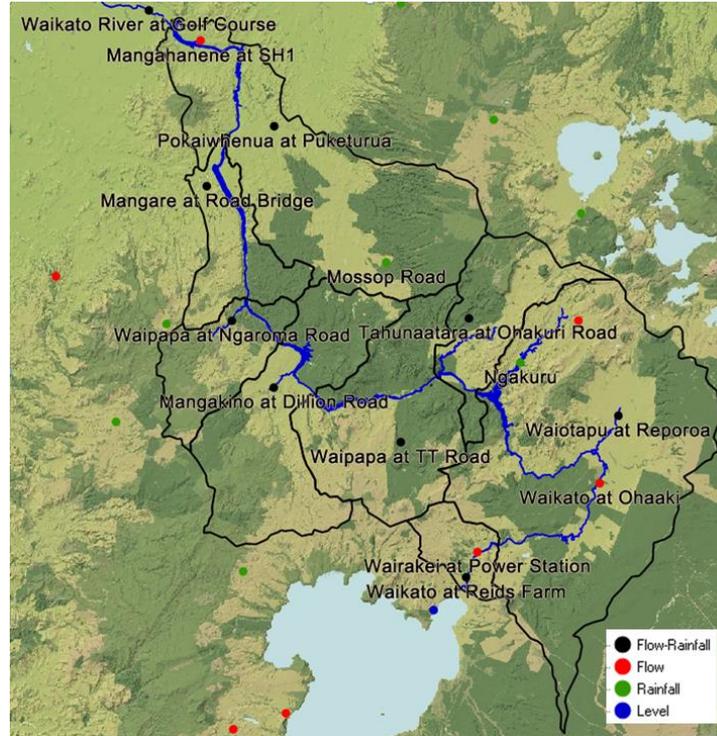
- > The available lake Taupo storage is 855 Mm³ (1.4m range and 611 Km² Lake area)
- > The available storage is used on average 5 to 6 times a year
- > The size of the hydro dams and reservoirs is such that the water obtained as a result of rainfall is able to be used for generation purposes
- > Mighty River Power has operated the Waikato Hydro Scheme since 1998 and during that time the annual inflow versus outflow of Lake Taupo has not varied by more than 5%.
- > The aim is to have the lake around 356.8 to 357.0 masl at the start of the year for drought contingency purposes.



Waikato Hydro System Catchment

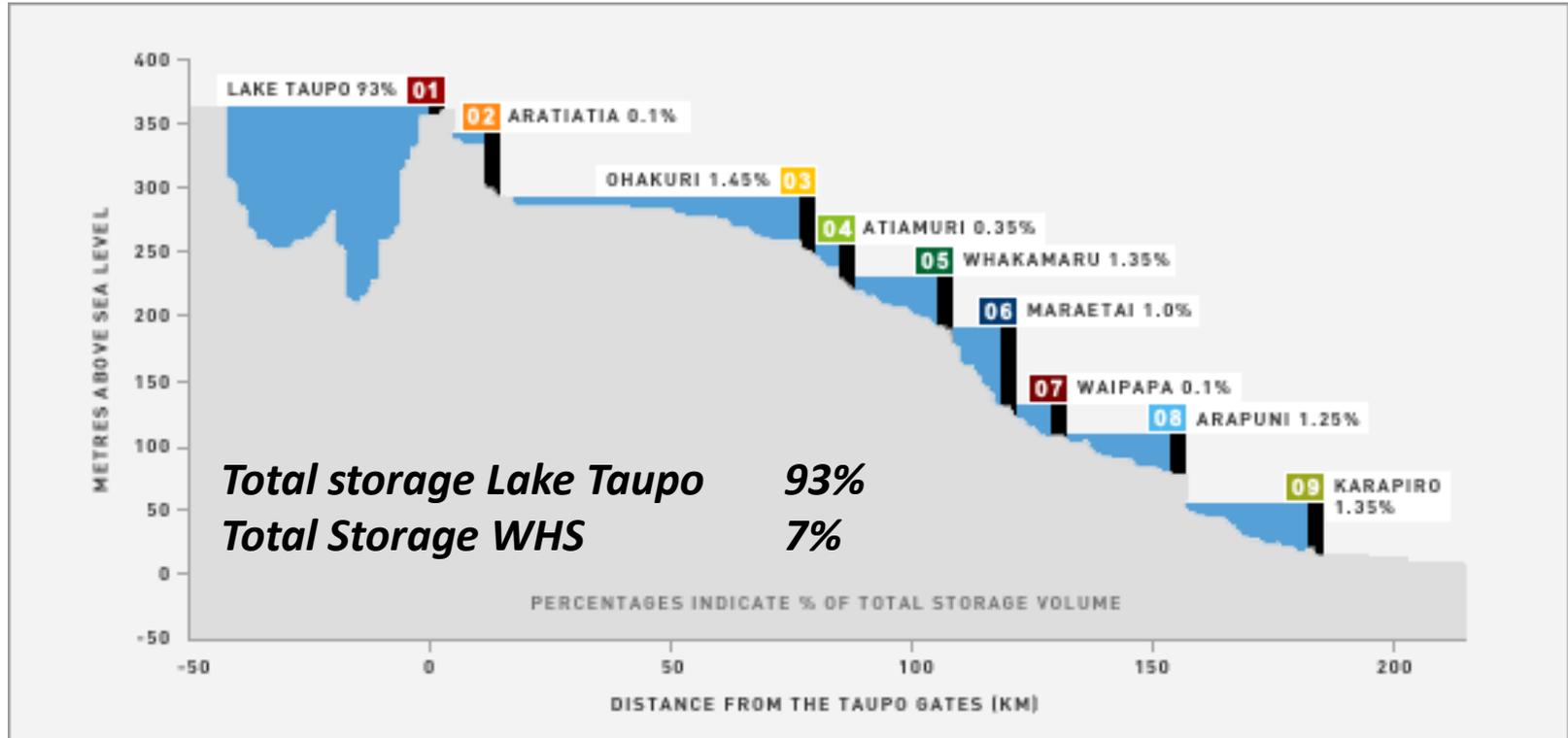


Waikato Hydro System catchments





Waikato Hydro System dam elevations



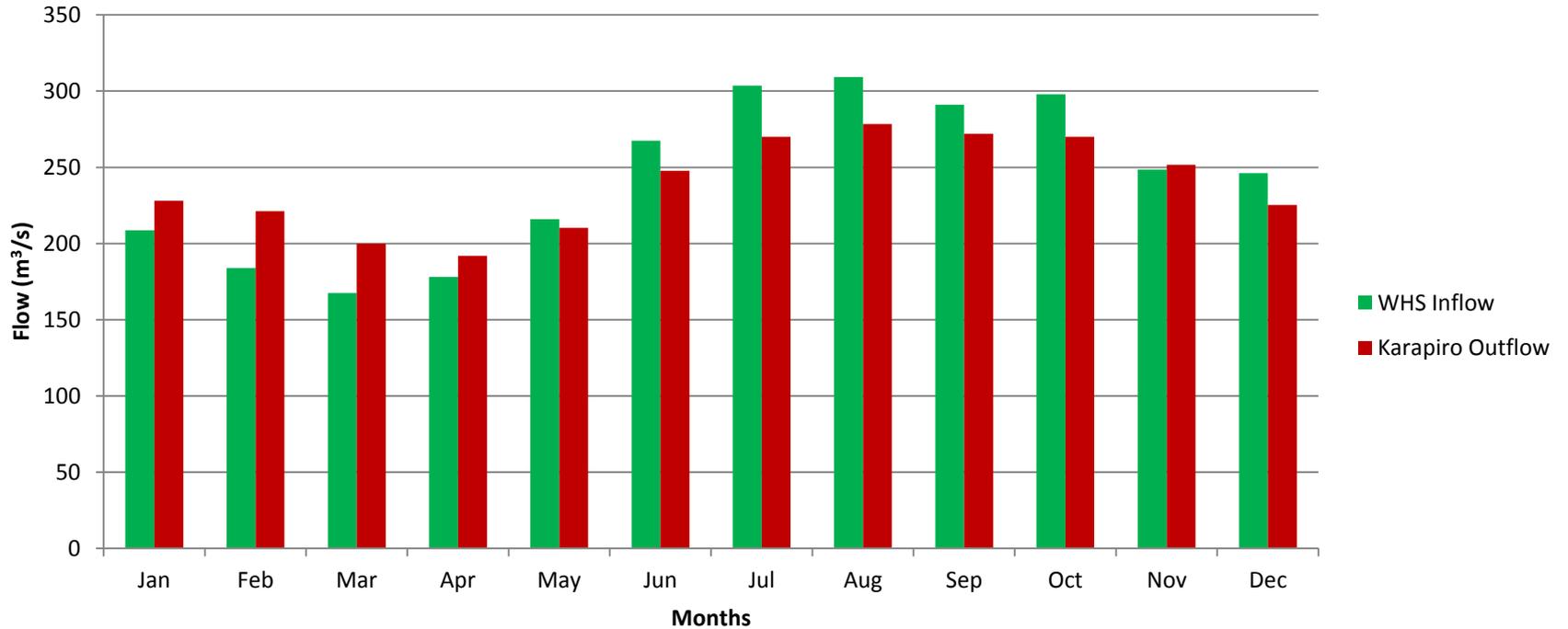


Modelled dam residence times

- > The dam residence time below are based on Opus modelling for the report “*Waikato Catchment Water Quality Model*” (2000), *Rutherford et al*
- > Residence time for a natural catchment from Taupo to the sea is 5 to 6 days
- > Residence time for low flows to pass through the hydro system (Taupo to Karapiro) is 30 days, from Taupo to the sea it is 35 days
- > Residence time for mean flows to travel from Taupo to the sea is 23 days
- > Residence time for high flows to travel from Taupo to the sea is 15 days
- > ENVCO conducted some flow velocity measurements for the hydro system



Waikato Hydro System inflow versus Karapiro dam outflow

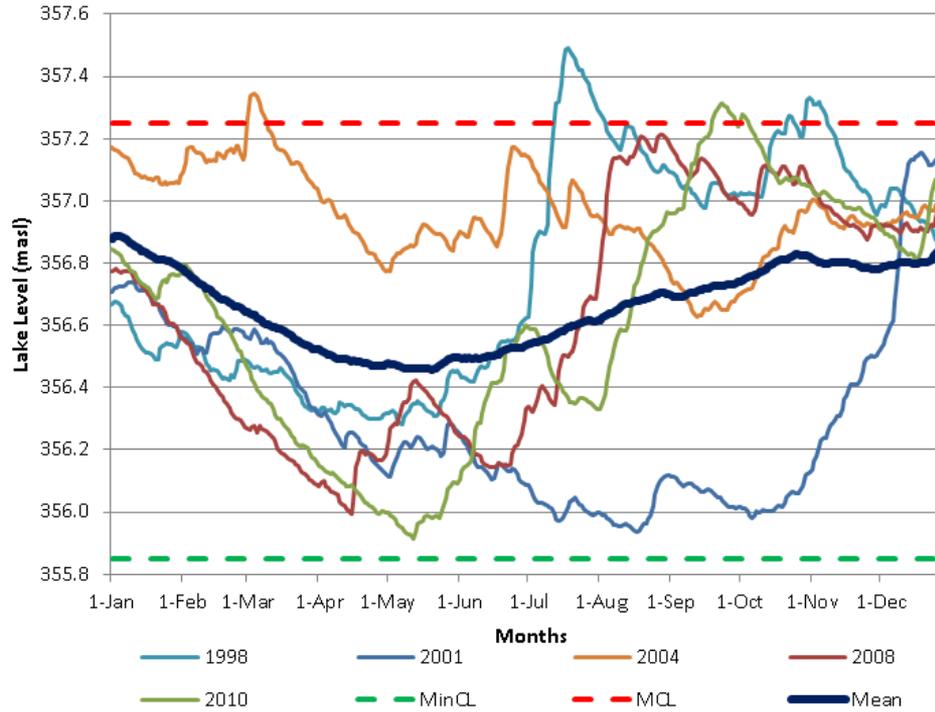




Operation under drought conditions



Lake level under drought conditions

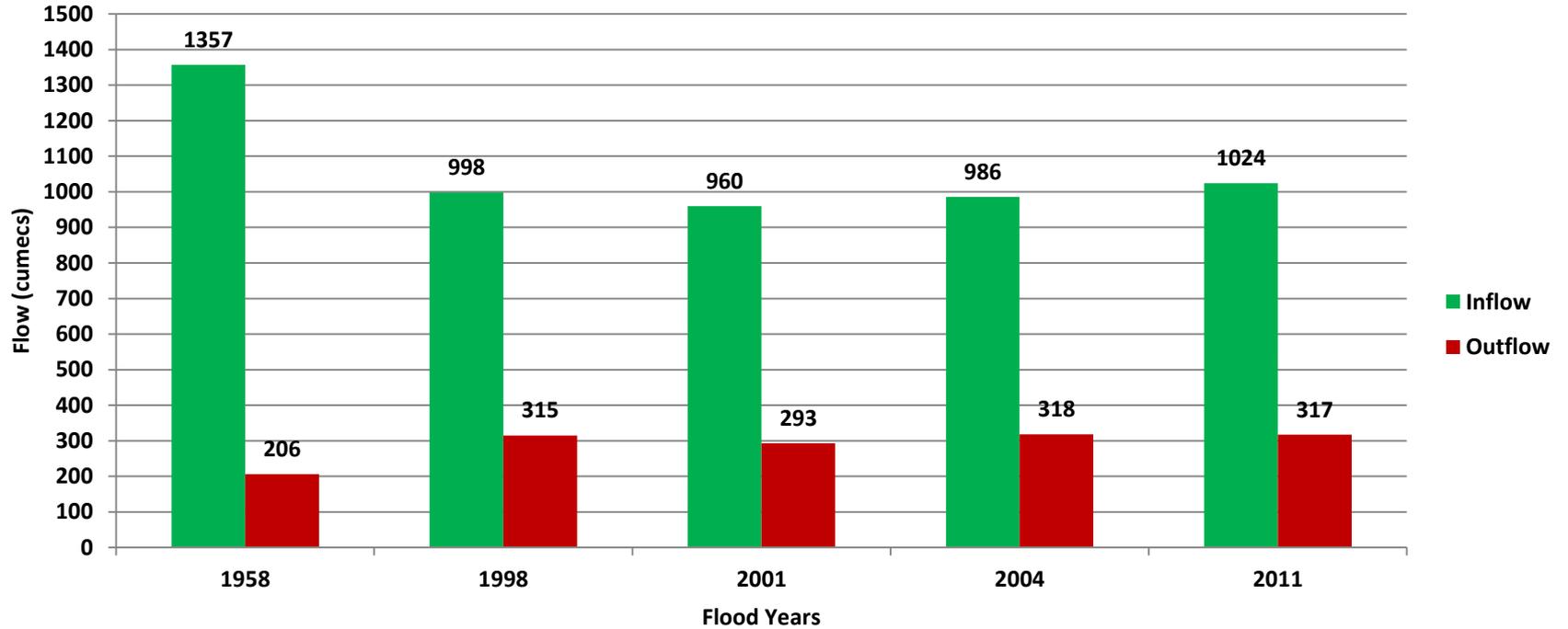




Operation under flood Conditions

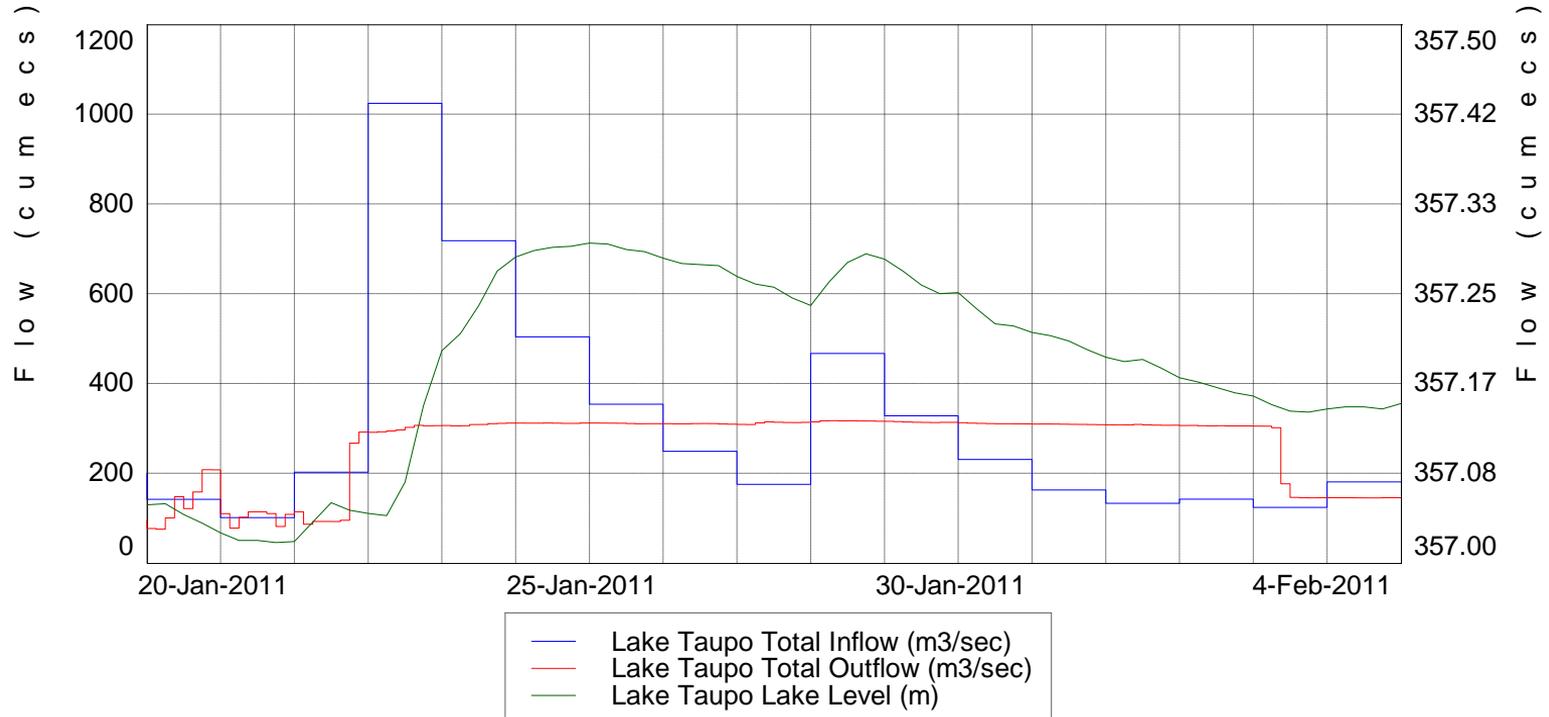


Taupo inflow and outflow



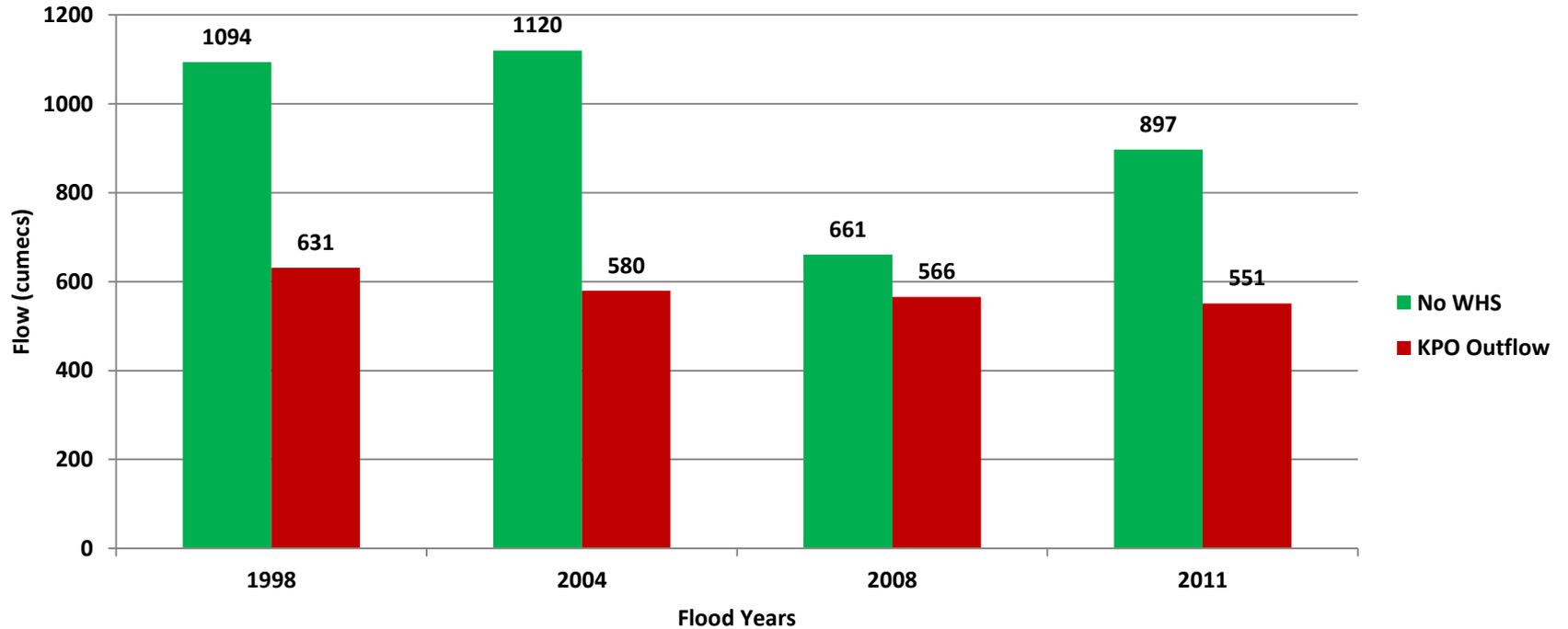


Lake Taupo flood inflow, outflow and level graph





Waikato Hydro System inflow and Karapiro outflow





Waikato Hydro System inflow and Karapiro outflow (2011 event)

