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What can Neolithic and Bronze Age lake dwellings tell us about former climate change?

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For over 150 years, archaeologists have been discovering remains of prehistoric Neolithic and Bronze Ages (approx. 4500 – 1000 BC) settlements in pre-alpine lakes, located under the water near the shoreline. Archaeologists are certain that these so called "lake dwellings" were moved up the hill as soon as the water flooded the houses continuously. Contrary, they were moved closer to the lake whenever the water retreated to a lower lake level. Different settlements were rebuilt at the same site after the floods retreated. One single location was used over many hundred years.

What people left behind was sedimented under water with carbonated fine material or left with the reducing influence of oxygen. Preserved wooden material has been dated by Dendrochronology and prehistoric tools typologically. This information gives an overview on the time people settled down or had to leave their houses.

What was the reason for the distraction of the lake dwellings? Archaeologists speculate that the main reasons for lake level fluctuations were varying precipitation and temperatures. Climatic changes seem to be the origin for giving up lake dwellings of Neolithic and Bronze Ages. Several layers containing chalk or cultural remains alternate and prove that the lake dwellings were episodically flooded. Because of the partly thick chalk layers archaeologists suspect that high lake level persisted floods happened also over longer periods.

To find out if change in precipitation and temperature can cause such long term lake level variations we use a hydrological model for the Lake of Zurich which considers also the former lake morphology, size and characteristics. We simulated different climate scenarios with varying precipitation and temperature series to reconstruct former lake level fluctuations. This shows whether long term flooding can be explained by climate change or whether archaeologists have to look for other explanations. Ad-

ditionally we also take a closer look at the lake level minima and maxima and try to reconstruct precipitation of Neolithic and Bronze Ages.