

New insights into managing our water resources

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Dr Tim Peterson, from the School of Engineering at the University of Melbourne has offered new theories that will lead to a deeper knowledge of how water catchments behave during wet and dry years. His research was published recently in the leading international hydrology journal *Water Resources Research* and was selected by the American Geophysical Union as a highlight of the society's 13 international journals.

Dr Peterson's work shows that some catchments have a finite resilience to wet and dry years because they have two steady states. The traditionally held view is that water catchments have only one steady state.

A steady state can be considered as how a catchment behaves after a disturbance like a wet year. Traditionally, hydrology has assumed that no matter how wet a year is, once the [rain](#) goes back to the average then the stream flow and [water table](#) will return to what they were before the wet year. Tim's work shows that in some catchments, after a wet year the [stream flow](#) and water table can return to a very different value. His theories explain how catchments switch between these steady states and how the catchment's resilience can be measured.

"Understanding responses and how water catchments react and recover from disturbances will allow better prioritising of investment and more informed decision making about water resourcing" said Dr Peterson.

Dr Peterson concludes we should not assume that water catchments always return to the way they once were after a major disturbance. "Major state and federal agencies are working with us to use these new theories. Together, we are coming closer to understanding which catchments have multiple steady states and how they can be managed."

Provided by University of Melbourne

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