

Satellite study identifies water bodies important for biodiversity conservation

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The Swan River in Western Australia. Credit: Wikimedia Commons

Using satellite images to study changing patterns of surface water is a powerful tool for identifying conservationally important "stepping stone" water bodies that could help aquatic species survive in a drying climate, a UNSW-led study shows.

The approach has been applied to the Swan Coastal Plain near Perth in Western Australia, which has more than 1500 water bodies and is one of 25 designated biodiversity hotspots on the globe.

The study is published in the journal *Environmental Research Letters*.

Scientists led by UNSW's Dr Mirela Tulbure analysed 13 years of Landsat images of the region, taken from 1999 to 2011, to gain a picture of the changing interconnectivity of the many water bodies on the plain over time.

"Aquatic systems are some of the most threatened ecosystems in the world, because they are affected by climate change and human factors such as urban expansion and use of [ground water](#)," says Dr Tulbure.

"These factors not only increase stress on the habitat of many water species, they reduce the opportunities for water-dependent organisms to disperse to neighbouring water bodies to breed and maintain resilient populations."

The Swan Coastal Plain was chosen as a study site because it has lost more than 70 per cent of its surface water bodies since European settlement, and the remaining ones are strongly affected by rapid urban development and [climate change](#).

"Our results showed a highly variable pattern of connectivity between water bodies that changed with the seasons. Overall, there was a decline in connectivity during the 13-year period, with potentially negative consequences for the species that have a limited capacity to move between water bodies," says Dr Tulbure.

"But we also identified stepping stone water bodies that are vital for connecting distant habitats because of their position in the landscape. This approach is a cost-effective way to prioritise which water bodies require better management and conservation to assist creatures with different travel capabilities, such as turtles and water birds."

The researchers recommend that the stepping stones on the Swan Coastal Plain, which are near the Peel-Harvey Estuary and in some national

parks, be targeted for conservation.

The team is now applying their approach to the Murray-Darling Basin, and Dr Tulbure says it could be applied to other habitat networks as well.

More information: "Spatiotemporal dynamics of surface water networks across a global biodiversity hotspot—implications for conservation." Mirela G Tulbure et al 2014 *Environ. Res. Lett.* 9 114012
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