Landscape-scale patterns in the diversity and distribution of invertebrate communities of temporary aquatic habitats across arid Australia

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Arid and semi-arid regions, where annual rainfall is less than 500mm/year and evaporation greatly exceeds precipitation, occupy approximately 47% of the global land surface and cover more than 70% of the Australian continent. Extensive river networks occur in arid Australia, but none support permanently flowing water. Instead, temporary to permanent pools, with highly variable hydroperiods, are present. There are also innumerable isolated lentic habitats, mostly also temporary, except where groundwater-fed. We used existing datasets to examine continental-scale patterns of diversity and distribution of the invertebrate fauna of these arid aquatic habitats. We found that species richness varied greatly across the arid zone and was influenced by both local and regional factors. The invertebrate community composition of pools within temporary river networks displayed some similarities, despite being separated by thousands of kilometers of arid land. The greatest differences in community composition were between surface water and groundwater-fed habitats. Further research is now underway to better understand the connectivity between these aquatic habitats and the dispersal of invertebrate taxa between temporary and permanent waters across an environmentally harsh landscape.