

“The Times They Are a-Changin” - Factors affecting observed spatio-temporal patterns in ground conductivity along the Murray River Floodplains, in south eastern Australia.

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The recent advent of calibrated airborne EM systems, coupled with effective ground-based calibration procedures and more robust inversion tools that can account for system geometry, have given added impetus to their deployment as tools to aid the quantitative *monitoring* of variations associated with floodplain ecosystems, and in particular processes connected with surface water and groundwater interactions. This also has implications for understanding the consequences of floodplain management.

In a pilot study in the Riverland of South Australia, we report on spatio-temporal variations observed in near surface determined from multi-temporal monitoring of a floodplain with AEM data. Significant increases and decreases in ground conductivity have been observed in particular locations adjacent to the river and on the floodplain, indicating areas where water levels associated with the underlying saline groundwater system have dropped, and others where it may have risen. These variations are attributed in part, to floodplain management strategies, including an operational salt interception scheme (SIS) and to changes in the regulated height of the river. The results also suggest that some parts of the river have changed from gaining to losing sections, indicating that the SIS may be achieving it's desired objective, namely of extract saline groundwater before it discharges into the Murray River.

Overall, these results suggest that airborne EM systems should now be considered as one means for quantifying spatial changes in the amount of salt stored on the floodplain, for monitoring the effects of particular management strategies, and for understanding floodplain processes.