Use of EM-38 Soil Salinity Surveys to Calibrate a 1-D Transient Model for Decision Support and Sustainable Salinity Management

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Motivation
Soil salinity is a major factor affecting irrigated agriculture in semi-arid regions world-wide. Re-use of saline-sodic drainage water to irrigate salt-tolerant forage crops reduces the volume of saline DW requiring disposal and it extends the irrigation water supply. Sustainability of forage production requires application of adequate irrigation water to leach salts from the root zone. Decision support is needed to guide these leaching decisions.

Technological Challenges
Agricultural soils are typically heterogeneous – developing sustainable irrigation and salinity management strategies require a combination of advanced survey and monitoring techniques and hydro-salinity models that water managers can understand and apply. Permanent, in-situ sensor networks may in time, allow improvements in salinity management in reuse areas where agricultural drainage is mixed with higher quality supply water to irrigate forage crops.

Research
Electromagnetic (EM-38 soil salinity surveys were conducted to assess the spatial distribution of salts in selected project fields. Soil, irrigation water and forage production data have been used to calibrate, validate and refine a hydrosalinity simulation model. All fields had lower salinity (Ece) at 0-30 cm depth than higher depths indicating some degree of leaching. Soil salinity is highest at the lower end of each irrigated basin.

References

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