



# SPATIAL INFORMATION DAY 2010

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## Spatial Information Day 2010 Abstract

**Title:** Salinity Monitoring using In-Stream, Close Spaced, Geo-Referenced 3D Salinity Mapping

**Session:** 3 – Environmental Management

**Presenter:** B.R. Porter & J. Tan - Department for Water

### Abstract:

Historically the River Murray in South Australia has carried large tonnages of dissolved salts (>1000 tonnes/day), sourced both from upstream of SA and from accessions within the state. This tonnage of salt converted to EC, at times exceeds World Health Organisation guidelines for potable water of 800 EC, and also exceeds desirable irrigation water EC for crop health.

In SA, continuous monitoring of in-stream EC has expanded to over 50 monitoring sites in 2010. Generally, these continuous EC logging stations are spaced between 20 and 30 river kilometres apart and usually at the start and end of river reaches of interest. These reaches include proposed and existing Salt Interception Schemes, areas of natural and irrigation induced salinity accessions, and reaches where defining salt loads is an important river management tool.

As well as continuous long-term monitoring, South Australia conducts Run of River salinity surveys which produce a kilometre-by-kilometre “snapshot” of salinity accessions along the length of the river. These surveys take place whenever suitable river flow conditions occur, generally on an annual basis.

Both techniques produce generalised reach-based salt loads to a km scale, however, the necessity for high location accuracy salinity mapping has been apparent for some time.

In-Stream, Close Spaced Geo-Referenced 3D Salinity Mapping is the most recent development in salinity monitoring in South Australia. Details of the equipment, data collection and processing techniques used to provide a 3D view of salinity accessions with salinity gradient mapping of accessions and mixing zones are presented. Multiple examples of salinity accession mapping and the influence of this data collection technique on Salt Interception Scheme design are also presented.

The data processing steps are presented, including converting the original Excel data into a point shapefile, the generation of a new digital elevation model (DEM) data incorporating the water body bottom elevation of the point shapefile and the conversion of 2D to 3D point shapefile.

Further steps taken are presented in ArcScene which detail the draping of the background aerial imagery onto the DEM, the application of a vertical exaggeration to show change in surface elevation and the 3D point shapefile colour coded with EC values enabling the visualisation of the EC data in a 3D environment.

Multiple examples of the 3D views will be presented including a moving graphics display of salinity changes in a highly reactive section of the Murray River.

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