The dissolved organic matter (DOM) present in a reservoir is comprised of a mixture of allochthonous DOM from various sources within the catchment and of autochthonous DOM produced within the reservoir itself. The relative amounts derived from these sources will depend on the biological and physico-chemical features of the reservoir-catchment system.

The character of the allochthonous DOM is not only influenced by the parent materials but also on the transport paths from the source to the reservoir. Factors such as the soil physical properties and mineralogy are important since the DOM will come into contact with the soil as it is transported from one environment to another. A geochromatographic process may take place where fractions of DOM are selectively adsorbed from the water by the soil's mineral matrix. Another important factor influencing the character of allochthonous DOM is the nature and degree of microbiological activity in the reservoir and the surrounding catchment. The character of DOM is also influenced by the climate, soil types and the type of vegetation in the catchment.

This study examined thirteen reservoir catchment systems in south-eastern Australian and compared features of the catchments in relation to water quality parameters of the reservoirs. Bulk water quality parameters of the reservoirs were compared both with the catchment characteristics and in terms of treatability by alum coagulation. Some water quality parameters such as specific absorbance (SUVA) and carbon to nitrogen (C/N) ratios can give an indication of the degree of terrestrial influence to the character of DOM in the reservoir. Reservoirs with both high SUVA and C/N ratios are more likely to be influenced by allochthonous inputs to reservoir DOM. SUVA can also be used as an indicator as to the ease of removing DOM by alum coagulation, and the potential to form trihalomethanes upon disinfection, while C/N ratio can be used as an indicator of terrestrial DOM sources that have a high bacterial regrowth potential. Both of these parameters can be used as indicators when deciding upon water treatment and catchment management strategies to minimize allochthonous DOM inputs to reservoirs. Specific sources of terrestrial DOM inputs to reservoirs were identified such as leachates from vegetation, humus and soils.

Pyrolysis-gas chromatography-mass spectroscopy, thermochemolysis and alkaline copper oxide oxidation were applied to determine structural and compositional differences between DOM derived from these terrestrial sources and compared to DOM from reservoirs. Pyrolysis of DOM yielded furans, aliphatic products and N-containing compounds which are indicative of polysaccharides, lipids and proteins, respectively. Thermochemolysis, a relatively new technique, enabled detection of methylated fatty acids, methylated sugars and methoxy-benzyl compounds derived from various sources of DOM. Of these compounds, methoxyphenols were used as bio-markers of vascular plant sources. Methoxyphenols were detected in DOM isolates from the vegetation, soils and reservoir waters of the catchments using copper oxide oxidation, and hence these compounds also appear to be a suitable bio-markers for tracing allochthonous DOM input into the reservoirs.