Uriarra Forest Revisited. (A03-denmead213023-Oral)

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Abstract:

The Australian Uriarra Forest experiment was conducted to explore George Thurtell's hypothesis that within the canopy space, concentration profiles would reflect more the source/sink distributions of scalars than the direction of their transport. There would be peaks and troughs in the concentration profiles about the sources and sinks, and below them, there would be regions of apparent counter-gradient flow. The experiment examined flux-gradient relationships for heat and water vapor in the canopy of a 16m high pine forest. Highlights of this largely untold story will be presented. Notable outcomes included: closure of the forest energy balance when all storage components in the canopy were accounted for; experimental documentation of source/sink distributions for heat and water vapor within the forest canopy through eddy correlation measurements at 8 levels; unequivocal evidence of counter-gradient transport within the canopy and failure of gradient diffusion to describe satisfactorily the transport of scalars anywhere in the canopy space; the dominating role in canopy transport played by large eddies that penetrated the canopy from above about every 3 minutes.

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