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# Simulations of a Demonstration of Cloud Albedo Change

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The Twomey effect describes how the reflectivity of marine stratocumulus clouds can be increased by a change of the concentration of cloud condensation nuclei. The increase can be sufficient to reverse global warming Latham et (2008). This paper combines real MODIS cloud images supplied by Rob Wood as part of the recent VOCALS experiment off the Pacific coast of South America with computer-simulated reflectivity change in pixels down wind of the release point. Initial cloud conditions, spray rate, wake divergence angle and drop half-life are varied over a range of reasonable values. The resulting images show that it may be very difficult to detect reflectivity changes necessary to reverse catastrophic global warming with the human eye to a level which would convince a non-technical decision maker that the procedure has had any effect.

The paper goes on to show that by taking a large number of different digitized cloud images, shifting them in the computer to align release points, rotating them to align wind directions and then adding them the background of uncorrelated cloud patterns will converge towards an even middle grey from which the correlated cloud images will emerge.

The figure below shows the result for one hundred super-positions except that it had to be removed because of EGU rules. The spray rate was 0.03 m3 sec, drop half life 59 hours, plume dispersion half-angles 1, 2, 5 and 10 degrees, initial drop concentration 65/cm3, wind-speed 6 m/sec, liquid water content 0.3 gm/m3 , boundary layer depth 1000 metres.