



Dust emission from playas in the Mojave Desert, USA

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The relations among playa type, playa hydrology, and surface-sediment characteristics are important controls on the type and amount of dust emitted from playas. The production of evaporite minerals during evaporative loss of near-surface ground water results in the creation and maintenance of several centimeters or more of loose sediment in wet-playa environments. Observations at Franklin, Soda Lake, and West Cronese Lake playas in the Mojave Desert (USA) indicate that these kinds of surface sediments are highly susceptible to dust emission and that deflation of this sediment by wind encourages rapid re-formation of evaporite minerals. The loss of water to vapor occurs in the capillary fringe zone between the water table and the playa surface. The surfaces of wet playas are dynamic. Surface texture and mineral composition change rapidly in response to fluctuations in water-table depth and to heavy precipitation events. In contrast to wet playas, dry playas are characterized by ground-water levels that are deep or are isolated from the surface by shallow confining beds. Consequently, dry playas commonly have hard surfaces that produce little or no dust if undisturbed except for transient silt and clay deposited on surfaces by wind and water. Although not the dominant type of global dust, salt-rich dusts from wet playas may be important with respect to radiative properties of dust plumes and atmospheric chemistry.