## 2.7 Wind Erosion

Wind-induced soil movement, or wind erosion, is a common and serious environmental problem attracting global attention. Wind erosion damages land and natural vegetation by removing soil from one place and depositing it in another. It mostly affects dry, sandy soils in flat, bare areas, but wind erosion may occur anywhere that soil is loose, dry, and finely granulated. It causes soil loss, dryness, deterioration of soil structure, nutrient and productivity losses, air pollution, and sediment transport and deposition. The presence of dust particles in the air is a source of several major health problems. Atmospheric dust causes respiratory discomfort, may carry pathogens that cause eye infections and skin disorders, and reduces highway and air - traffic visibility. Dust storms can cause additional problems. Buildings, fences, roads, crops, trees and shrubs can all be damaged by blowing soil, which acts as an abrasive.

Soil movement is initiated as a result of wind forces exerted against the surface of the ground. For each specific soil type and surface condition there is a minimum velocity required to move soil particles. This is called the threshold velocity. Once this velocity is reached, the quantity of soil moved is dependent upon the particle size, the cloddiness of particles, and the wind velocity. Suspension, saltation, and surface creep are the three types of soil movement which occur during wind erosion (Figure 2-10). While soil can be blown to virtually any height, over 93% of soil movement takes place within one meter of the ground.

Wind and wind-blown sand are an environmentally limiting factor throughout much of Riverside County. Approximately 20% of the land area of Riverside County is vulnerable to “high” and “very high” wind erosion susceptibility (Figure 2-11). The Coachella Valley, the Santa Ana River Channel in northwestern Riverside County, and the community of Hemet are zones of high wind erosion susceptibility.

### 2.7.1 Coachella Valley

Wind-blown sand is a well-recognized hazard for developments in the Coachella Valley, with greatest activity in the central region from Palm Springs to the northern portion of La Quinta. Wind-blown sand has forced abandonment of dwellings and subdivided tracts in the central Coachella Valley (Sharp, 1980). Utility poles in the area are frequently armored with sheet metal around the base to protect against wind erosion. Caltech investigators interested in measuring the destructive effects of wind near Garnet Hill located several sample plots with sampling materials that included 2 to 3-inch thick lucite rods, common bricks, hard crystalline rock, and gypsum-cement cubes. As a result of wind erosion, one lucite rod was severed, and many of the brick and rock samples were eroded up to several centimeters per year.