Erosion and the Carpinteria Watershed: Take These Words with a Grain of Silt

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God made dirt, so dirt can't hurt…or can it? Development in Carpinteria and other South Coast watersheds is contributing to a flourishing greenhouse industry as well as creating a housing boom with associated benefits to our local economy. However, it is also having many unintended consequences in regards to our environment. Take a grain of silt, for example. Smaller than the point of a pin in size, it often goes unnoticed to the naked eye. In an undisturbed environment, silt is found attached to the root hairs of plants or held in place under layers of decaying organic matter. When grading for construction or plowing for crops occurs, however, the plants that secure these grains of silt are destroyed and erosion is caused by the next rain storm or strong wind.

Our friendly little grains of silt then begins its journey in our creeks along with billions of other grains. As they travel along, they scatter light, reducing photosynthesis and algal productivity. This in turn reduces the amount of food available for stream insects as well as deteriorating the quality of the algae already present. Many insects consequently drift farther down the stream in the hopes of encountering better habitat in which to forage. One would think that this pulse of insects floating down the stream would benefit trout and other fish. However, billions of silt grains also have the undesirable effect of impairing the ability of fish to locate food. Thus, before silt has even entered the ocean, it has already reduced creek productivity at every level in the food web.

When it comes to silt, is the ocean the 'dilution solution'? Based on studies done on coral reefs, it appears that silt can smother animals attached to the rocky substrate.. These organisms often spend weeks in the ocean as larvae before eventually settling onto a reef in a form that is of microscopic size. The implications of these studies spell trouble for Carpinteria Reef and other nearshore rocky reefs. Any giant kelp spore, larval cup coral, or barnacle cyprid may find that when it is ready to settle onto a rock and spend its life as an adult, our friendly little grain of silt is already occupying the space. Equally problematic, these species may find that even after settling, they are crushed by billions of silt grains entering from land or resuspended during heavy swells.

The Santa Barbara Coastal Long Term Ecological Research program, run by the University of California, Santa Barbara, is currently studying the relative importance of oceanographic, terrestrial, and within-reef processes in determining the types of species found on nearshore rocky reefs. It is my hope that through our efforts we will identify the extent to which coastal urbanization can continue without damaging environmental integrity.