

What sustains all of the life in Waller Creek? Like most streams, Waller Creek depends on two sources of energy, termed “autochthonous” and “allochthonous.” Autochthonous energy is that produced inside Waller Creek, from the organisms that live there. Allochthonous inputs come from nutrients elsewhere that make their way into the creek.

Algae are microscopic plants that use sunlight energy to manufacture starch, sugars, and oils through the process of photosynthesis. Photosynthetic algae, like those pictured here, are the primary producers of autochthonous energy in Waller Creek.

Most algae and plants have organic cell walls. Diatoms are unique among algae, because they have cell walls made of actual glass. Diatoms are among the favorite foods of aquatic insects, tadpoles, and juvenile fish in Waller Creek. The photographs of these two diatoms from Waller Creek were taken with a scanning electron microscope to show the fine details of their cell walls. Diatoms are very small. Each diatom pictured here is about 10 micrometers across, or only one one-hundredth of a millimeter.

Streams are interesting ecosystems because of the interaction between life in the stream and life on land. Allochthonous inputs represent a major source of energy for Waller Creek. These include all of the nutrients, leaves, wood, and terrestrial insects that somehow find their way into the creek. For instance, leaves are not very nutritious on their own, but they are excellent places for bacteria, algae, and fungi to grow. As a result, insects that feed on leaves actually get most of their energy for the microorganisms that live on the leaves.

Different stream environments have different amounts of autochthonous and allochthonous energy inputs. Sections of Waller Creek that are heavily shaded by streamside vegetation contribute more allochthonous inputs. But sections with open canopies offer more sunlight for algae and so contribute more autochthonous inputs.

The Waller Creek food chain depends on both kinds of energy input, and involves many different kinds of plants and animals. Algae use sunlight and nutrients to manufacture sugars and oils. These algae, in turn, are consumed by microinvertebrates, insects, tadpoles, and small fish. Many of these small animals are then food for predatory crayfish and dragonfly larvae. Large fish, snakes, and predatory birds enjoy life at the top of the Waller Creek food chain.