

Intro to Permaculture – Permaculture Design for Water

Video Transcript

Music

Water - Design for water is the bones of any Permaculture system and often times the way the layout works with water determines the basic shape of things. Remember our Permaculture principles, which tell us to Observe and Interact, and Design from Patterns to Details. Our powers of observation and our ability to see the patterns of water flow need to be developed before we can design for water on our sites.

A water supply represents potential; the potential for people to drink, wash and cook, the potential for irrigating crops, the potential to generate electricity, the potential to raise fish, and the potential to grow a forest. So the first rule of working with water is to keep it in its place of highest potential in the landscape, up high.

For a house, the roof represents the place with the highest potential. With the right roofing materials, clean water can be had and directed into a storage tank for later use. It never touches the ground, so remains clean. It can flow by the force of gravity, and be directed to where you want it. The sides of a roof are like the slopes of a mountain. When we think of keeping water in its place of highest potential in the landscape at this scale, we think first about covering bare ground with plants and making the soil able to absorb water. Next we think about places where we can safely intercept the flow of water with the least amount of effort and damage. On damaged land, we may need to do some surgery to get the water to slow down, this may take the form of a swale or a ditch to intercept its water on the way down a slope and soak it more into the soil, or direct it into ponds or reservoirs. This is what we can see on a large scale at the Al Baydha project in Saudi Arabia. When we soak water high up in the watershed, it still moves down, but percolates underground through the soil, slowly replenishing water tables and feeding streams down below.

Slowing, sinking and spreading the water so it has more surface area contact with the earth will allow time for soils to become deeply saturated. Deeply wet soils can support trees and shrubs, which in turn can grow food, create habitat, block the wind, cast shade, produce firewood, attract bees with blossoms, and provide building materials. The protection that these trees provide causes less evaporation from the sun and wind. We can see at the urban scale at the house of Brad Lancaster in Tucson, Arizona where he created a Sonoran Desert forest in the heart of the city using these rainwater-harvesting principles. The ground stays wetter for longer, and it feeds a cycle of rehydration. We start by planting the water high up in the watershed, and working our way down.

Big open water storages in the desert will have a lot of evaporation, but in the cool and cold temperate regions and wet tropics, large open storages of water can have huge benefits. A series of interconnected reservoirs can virtually drought proof farms by storing enough water to last through prolonged dry spells.

In the tropics, we find historic examples of how to maximize productivity and edge as we get to the lower, wetter parts of the landscape. Mexico City is an ancient settlement location, and it's in a giant bowl surrounded by mountains where water doesn't drain, so the bottom was a huge swamp. The Aztecs built a vast network of islands called chinampas, where they dug down canals in the muck and piled it up onto rafts, which were then planted and took root. To this day, the chinampas of Mexico City are productive gardens, which help feed the city. The canals are the transportation, and fish can be caught in them too. Every time a canal is cleaned out, the mud and muck are piled on to fertilize the chinampas.

Wetlands have a natural capacity as filters, because we find wetlands low down in the watershed, and they're used to filtering everything coming down. So we use this fact to our advantage when creating our own wastewater treatment systems. Constructed wetlands, greywater systems, and living machines are all types of biological treatment that you can read about in the links. We build artificial wetlands to handle our wastewater and use the biology of healthy soil and aquatic plants to break the bonds of and absorb pollutants.

Water is life. Water is sacred. We must protect the water, and use Permaculture design to replenish and clean water, and restore a healthy hydrological cycle.