



PJ Chmiel

8:50am Dec 11

Wonderful program, I typed up some notes last night and will re-post them here, for those not on the Van-Kal Permaculture e-mail list or FB page:

The presentation tonight was as great as I knew it would be, Peter is a brilliant speaker, he knows his material inside-out, he doesn't read from notes and still sounds as natural, intelligent and authoritative as any college professor I've ever heard. I'm kicking myself for not having a video camera set up to record it for those who couldn't make it...I did however jot down some notes, which I'll type up below. Thanks to all who showed up, I enjoyed seeing some familiar faces and reconnecting.

Notes from Peter Bane's Presentation on Water,
Two Rivers Coalition Annual Meeting, 12/10/14

- The main objectives in Permaculture for water are to SLOW it, SPREAD it, and SINK it in. Water is heavy and it wants to move downhill with gravity. Swales, berms and perennial (woody) vegetation are very beneficial on slopes. Bare soil + fast-moving water = massive erosion of topsoil. The ratio of speed to carrying capacity is cubed, so that 2x the speed equals 8x the sediment carried.
- Most of Earth's water is salt water (40 gallons of that to every 1 gallon of fresh). Of this fresh water, 75% of it is inaccessible, tied up in ice or deep below the ground.
- Soil is the cheapest form of storage for water, followed by dams, ponds and tanks. Tanks are important for storing large volumes of rainwater, to capture excess and store for irrigation/household use during droughts. Soil rich in organic matter can store many times the water of poor soils.
- There's as much fresh water touching Michigan as there is water in the atmosphere and all the rivers on the planet combined—we are extremely fortunate in this regard, many parts of the world suffer from dire water shortages.
- Most of MI's water flows into the Great Lakes and out to the St. Lawrence river. The Great Lakes watershed is relatively small.
- Climate is getting more extreme: the "Standard Mean Deviation" used to be 10%, now it's up to 40% (hotter, colder, drier, wetter, windier, snowier, etc. than averages).
- 70% of rain falls on earth during "flood" times, i.e. when we already have too much and it can't immediately be used or absorbed into the ground. All the more reason for large-scale storage, earthworks, and any measures we can take to slow/spread/sink it before it disappears.
- Some places on earth receive no rainfall at all, humans have learned to capture dew or fog as sole means of water harvesting there.
- 1/4 of municipal power is used for pumping water. Home water conservation saves energy in this way.
- Every impervious surface is a mini watershed—usually starting at the peak of our roof, and including paved driveways, sidewalks, roads, etc.
- In Australia (very dry), rainwater storage is often mandated by law and required before municipal hookups are approved.

- Cleaning rainwater to drinking quality takes very little filtering. Rain water is naturally "soft" and has many benefits to plants and soil.
- Rooftop calculations: Every 8 square feet of roof catches 5 gallons of water in a 1" rain, or 625 gallons on a 1,000sf house. In our climate, a house this size gets over 20,000 gallons of rainfall per year—makes a 50 gallon rain barrel seem a bit undersized!
- Stored water creates a kind of "thermal battery" since water is heavy and slower to change temperature than air. This creates microclimates and special planting opportunities. Peter and Keith have a homemade 10,000 gallon ferrocement cistern which does not freeze solid in winter. They attached a root cellar to the north side to take advantage of this temperature stability. They use the water for gardening, flushing toilets, washing clothes, and more.
- Front yard techniques: mellow "speed bumps" added to gravel driveway at an angle to stop water washing it out, raised garden beds (paths dug out and filled with woodchips, extra soil mounded) allow earlier planting in wet Spring season in heavy soils. Water was also directed away from house to mitigate crawlspace flooding issues. Be aware of how water is moving around your landscape.
- Polluted water is usually just overloaded with nutrient, i.e. animal/human/fertilizer wastes. This can be purified by using plants like cattails and other Macrophytes which break waste down aerobically and filter the water. Municipal-scale versions of this exist, the TVA has done the research and has data.
- Simple "Check Dams" and gabions made of rocks can slow gutter erosion. We often see these in ditches alongside highways now. They slow water and filter out silt. Best if used to create a more meandering path for the water, as this slows it down. Healthy streams have many curves, especially as they get closer to their outlets.
- Steep slopes need permanent vegetation, and riparian areas can be improved by adding "stakes" (cuttings) of willow, alder, elderberry, dogwood and other easily-rooted, water-loving perennials. Riparian areas should really all be forested if we're serious about water quality and controlling erosion.
- Greywater systems—already legal (and encouraged) in many western states, simple to put together, great way to divert bathing/washing water from septic systems and treatment facilities. Woodchip basins work well, good for fruit trees, but not recommended for root crops or foliar application.
- Peter and Keith have reduced their daily water consumption from the US average of 100-150 gals/person/day to 6-10 gals/person/day by using a wide variety of techniques.
- Humans are not just destructive creatures—we can also be restorative!

In closing, here's another video of Peter talking about the water systems in their Indiana yard: https://www.youtube.com/watch?v=hjP0TnW9_IQ



Renaissance Farm Water Systems explained by Peter Bane- The Permaculture Handbook

Peter Bane, permaculture designer, teacher, consultant, editor & publisher of the "*Permaculture Activist*" magazine.