

# Water Quality Principles for the Red Cedar River Watershed

--See <http://basineducation.uwex.edu/lowerchip/redcedar>

## Phosphorus Basics

- Runoff pollution, aka nonpoint source pollution, is the biggest source of water pollution.
- Water pollution comes from human activities on the land.
- The human managed landscape is exceedingly rich in phosphorus.
- Lakes, rivers and streams are naturally very low in phosphorus.
- A little excess phosphorus stimulates a lot of plant and algae growth.
- The vast majority of runoff --and therefore runoff pollution-- comes from a few major rain and snowmelts each year --typically less than six "runoff events" annually.

## Infiltration is the Key

- The opposite of runoff is infiltration. More infiltration = less runoff = less water pollution.
- Infiltration occurs when runoff water flows into or across stable, permeable surfaces or structures where pollutants settle out and the water soaks into the ground.
- If you can see soil erosion --e.g., small ephemeral gullies, soil deposition-- it is too high.
- When you see bare soil think soil erosion, water pollution.
- Urban storm drains deliver all the runoff water from city streets and paved areas directly and untreated to the nearest river or lake. Pavement = 100% runoff, 0% treatment.
- When you see grass, leaves, soil, etc. on pavement think water pollution.
- With heavy rains and snow melts think water pollution.

## Fair Share: We're all in this together!

- You live, work and play in a watershed.
- Runoff pollution comes from innumerable small sources.
- No single source contributes significantly to the problem.
- The sources of runoff pollution are invisible as they are common, everyday activities.
- Everyone should take responsibility for the water that runs off their property.
- Everyone can take action to reduce runoff pollution.

## The Long View

- A huge amount of phosphorus, and many other pollutants, are already in the sediment on lake bottoms and streambeds --a "legacy" from decades of pollution.
- Clean water will require significant, widespread, permanent changes in land use.
- Restoring the ecological health of the watershed will take a long time.
- We cannot solve problems with the same thinking that caused them.

## Disproportionality: Landscapes and land use practices vary greatly

- A minority of the watershed area produces a majority of the pollution.
- Cropland is the biggest source of runoff pollution in the watershed because it is a major land use and because it is intensively managed every year --tilled, manured, fertilized-- often when the risk of major runoff events is the greatest.
- A minority of farm fields contribute the majority of the runoff pollution from cropland depending on landscape features and how it is managed.
- Slope, slope length, soil type, proximity to lakes, rivers, streams and waterways, are some of the main landscape determinants of runoff pollution risk from cropland.

## **Individual Action**

- Crops grown, tillage, soil cover, soil test phosphorus and manure management are some of the major farm management determinants of runoff pollution from farm fields.
- To significantly reduce water pollution from farmland will likely require significantly less soil erosion than current standards --"Farming to T" is not a water quality standard.
- In urban areas we need to keep grass, leaves, pet waste, fertilizer, soil (including construction site erosion), oil, trash -- and everything else -- off pavement and direct runoff to, and create areas where, runoff water can soak into the ground.
- Our lakeshores, river and stream corridors should be stable (not eroding), and naturally vegetated (to filter runoff, improve water quality and wildlife habitat).

## **Solutions Exist!**

There are many farmers, homeowners, municipalities and many other groups and individuals who are already using technologies, practices and systems that significantly and profitably reduce runoff pollution. Let's learn from them! Many solutions to water pollution are simple, like don't blow grass into the street!

## **Farm and Country Solutions!**

- ✓ no-till,
- ✓ cover crops,
- ✓ contour farming,
- ✓ grassed waterways,
- ✓ conservation tillage,
- ✓ manure management,
- ✓ Streambank/lake shore buffers,
- ✓ nutrient management planning,
- ✓ grassed-based livestock systems,
- ✓ barnyard/farmstead runoff controls ... and many, many more.

## **Urban and Suburban Solutions!**

- ✓ rain gardens,
- ✓ street sweeping,
- ✓ porous pavement,
- ✓ mulching lawn mowers,
- ✓ composting grass and leaves,
- ✓ roof runoff detention ponds/swales,
- ✓ pavement runoff detention ponds/swales,
- ✓ plan for less paved area (i.e., unused parking lots),
- ✓ construction site erosion control ... and many, many more.

## **Awareness -- Education -- Commitment -- Involvement -- Action**

You (and your friends and neighbors and colleagues and fellow citizens) can make a difference!

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