

Outline

- 1. Water Conservation Indoor/Outdoor
- 2. Recycling
- 3. Household Hazardous Waste
- 4. Nonpoint Source Pollution
- 5. River Friendly Lawn Care
- 6. Water Wise Landscaping
- 7. Water Wise Irrigation
- 8. Yard Management
- 9. Impervious Surfaces

Water Conservation Why it is important

- 1. Fresh water is a limited resource
- 2. Water equals life
- 3. Save money
- 4. Protect natural resources
- 5. Save energy
- 6. Help meet future needs
- 7. Help our neighbors near and far





Leaks

- 14% American average household water use from looks
- Equals 1 TRILLION gallons every year
 - > = LA + Chicago + Miami
- Check for leaks 1-2 times a year
- How to discover leaks
 - > Toilet leak tablet/food coloring
 - Check showerheads and faucets
 - > Know your water bill
 - Use water meter
- Leaks are (usually) an easy fix
- http://www.conserveh2o.org/indoor-leak-detection-repair

Toilets

- Federal plumbing standards 1.6 gallons per flush (gpf)
 - > Older toilets (1980-1992) 3.5-7 gpf
 - > Pre 1980 8 gpf
- Look for WATER SENSE label (<1.26 gpf)
- Ultra Low Flow Toilets (ULF) max 1.6 gpf
- High Efficiency Toilet (HET) max 1.3 gpf
- Dual Flush Toilets (full/half flush options) 1.1 gpf or less

Toilets - Low Flow Conversions

- Install adjustable flapper (\$10) up to 3 gallons
 - > Replace flapper once a year
- Install tank bag (\$2) depends on size of bag
- Install fill cycle diverter (\$1) ½+ gallon per fill
 - Diverter + tank bag = up to 1 gpf
- Use filled plastic bottle*
- Every toilet is different
- Do NOT use a brick

Tubs/Showers

- National Energy Policy Act showerhead standards
 ≤2.5 gallons per minute (gpm)
 - > Prior to 1980 showerheads 5 gpm
 - Now find some as low as 0.75 gpm
- Look for showerheads < 2 gpm (\$10-20)
- Switching showerheads may reduce water bill by 25-60%

Tubs/Showers

- Take shorter showers install shower timer
 - Every minute less saves up to 2.5 gallons of water
- Take showers not baths or fill tub only half way
 - ➤ EPA finds ~35 gallons to fill tub
 - > 12.5 gallons with low flow showerhead
- Test shower rate by filling 1 gallon bucket with water; if it takes more than 24 seconds to fill, your showerhead is >2.5 gpm
- While waiting for shower to get hot, fill a bucket and water indoor/outdoor plants

Kitchens

- Energy STAR dishwashers use <5.5 gallons per load (gpl)
 ➢ Older models up to 10-15 gpl
- Average American does 110 loads/year
- Only run dishwasher when full
- Use dishwasher and scrape food from plates
- Keep pitcher of drinking water in fridge/heat water on stovetop
 - Reduces running water time
- Limit disposal use (COMPOST!!)
- Install point-of-use water heater (\$200)

Faucets

- Repair leaky faucets
 - > Can waste up to 2000 gallons/year!!
- Traditional faucet flow 2.2 gallons per minute (gpm)
- Install faucet aerator on all faucets (<\$1)
 May save up to 1 gpm
- Aerators come with many new faucets
- Downside may take longer to fill pot/bucket



Laundry Room

- Wash only full loads
- Wear clothes more than once
- Know your Water Factor (WF) number
 - Accurately compares washers of different sizes
 - Accurately compares washers of
 - ➤ Energy Star WF ≤6
- Upgrade to high efficiency washer (HEW)
 - Older washers use 40-45 gpl and WF 10+
 - ➤ HEW use 14-25 gpl and WF ≤8
- HEW save 6,000+ gallons per year, save energy, clean clothes better, reduce fabric wear

Around the House

- Install hot water recirculation system or tankless water heater (AKA on-demand water heater) \$200
- Positon water heater close to where it is used
- Insulate pipes and water heater
- Utilize grey water
- Nontoxic/Earth friendly paints
 - Low volatile organic compounds (VOCs)
 - > Traditional paint loaded with VOCs
 - ➤ Releases VOCs for several years
 - Mad as a hatter!





Some Facts

- U.S.A creates 40% world's waste and only recycles 28%
- Average American 1,000+ lbs. trash/year and 60-70% can be recycled or reused
- Americans place 3X amount pressure on environment versus global average
- 18,500 landfills since 1979; reduced by 84% since
 - > Trash had grown 80%
 - Over 100,000 tons waste incinerated every day
- There is no AWAY Landfills are filling land (and water)
 - Siting issues, leaching problems, toxic materials



Recycling 🔀



- 2.5 million plastic bottles thrown 'away' every hour
- Average 'tap rate' is \$0.49 per year; 8 8-oz bottles of water will cost over \$1400 per year
- Two months of water use by 1 person is the same amount of water saved for ever ton of plastic recycled
- Recycled #5 used for 3D printing

Paper

- We use 650 lbs. every year
- Recycling one ton of paper saves 7,000 gallons of water
- If 1/10 of all newspapers recycled, 25 million trees saved
- Enough office/writing paper thrown 'away' each year to construct a 12 foot wall from LA to NY



Recycling 🔥



Steel

- Using recycled steel to make new materials reduces water use by 40%
- Amount of steel recycled annually enough to supply LA almost ONE DECADE worth of electricity

Aluminum

- Results in 97% less water pollution
- Each year US uses 65 billion soda cans
- Our commercial air fleet could be rebuilt every 3 months with the amount of Aluminum we throw 'away'



Recycling 🚺



Did you know?

- Glass and aluminum never loses integrity
 - Glass mostly recycled into new glass, some into fiberglass
 - ➤ Aluminum cans in US contain 50% recycled content
- Motor oil does not wear out, it just gets dirty
 - Recycle used motor oil at most local auto stores
- States with bottle deposit laws have 35-40% less litter by volume
- You can make \$\$\$ recycling steel



Recycling – FM Area 🚺



Curbside recycling is FREE or Fargo-27/Mhd-4 drop off sites

- Glass brown, green, blue, clear
 - NOT Pyrex, window glass, standard light bulbs
- Plastic Moorhead #1, #2, #4, #5, #7 Fargo #1-7
 - NOT Keurig cups, plastic bags, shrink wrap, styrofoam, pump spray tops, swimming pools, plastic furniture
- Aluminum/tin cans
 - NOT aerosol cans, nails, rusty cans, razor blades
- Cardboard
 - NOT waxed or dirty
- Newsprint/Magazines



Other things to recycle

- Crayons www.Crazycrayons.com
- Corks www.recork.com
- Hair www.Matteroftrust.org
- Christmas lights Home Depot (November)
- Freecycle.org website to donate unwanted materials
- Cell phones
 - Call2Recycle FM locations-Best Buy, Acme Tools, Sears, Interstate battery, Home Depot, Lowes
 - > Rape and Abuse Crisis Center
 - Fundraisers: Arc thrift store, Adopt a Pet of FM, www.cellphonesforsoldiers.com

Prescription Disposal (over the counter drugs, too)

- Do NOT flush
 - > The treatment plant cannot filter all the ingredients in medication
- Police Stations Fargo, Moorhead and West Fargo
 - > All three are a little different
 - > NO NEEDLES
- IF you cannot make it to the police stations
 - > Take out of original container and mix with other substance (coffee grounds, salt, flour, etc.) before hiding it in your trash
- Remove label before recycling the bottle

Household Hazardous Waste

- Anything labeled:
 - Danger Toxic Poisonous
 - > Examples: weed/insect killer, fluorescent bulbs and ballasts, bleach, household cleaners, auto fluids, etc.
- Items should be in original container do NOT mix
- Items should NOT be stored in hot/cold places
- Fargo (& WF) 606 43 ½ St N (701)281-8915
 - Open daily (closed 12-1pm Dec-April)
 - M, T, Th, F 9am-5pm, W 8am-4pm, 2nd Sat 8am-12pm
- Moorhead/Clay Cty 2729 Hwy 10 E (218)299-5077
 - Closed Nov-March
 - April-Oct M-W 8am-4pm, 1st Saturday 8am-12pm

DIY Non Toxic Cleaners

Why make your own cleaners?

- Keeps toxic substances and Pharmaceuticals and Personal Care Products (PCPPs) out of our waters
- Save money
- It's EASY!!!



DIY Non Toxic Cleaners What you will need













DIY Non Toxic Cleaners

- Vinegar cuts grease and soap scum, dissolves mineral deposits, anti fungal, natural freshener
 - > Studies find distilled white vinegar kills 99% of bacteria, 82% mold, 80% of viruses
- Kosher salt scours and disinfects
- Castile Soap cleans, cuts grease, disinfects
- Borax cleans, deodorizes, disinfects
- Baking Soda cleans, deodorizes, scours
- Lemon Juice non toxic bleaching agent, cuts grease, disinfectant

DIY Non Toxic Cleaners

Essential oils: what they are and their benefits

- Extract from plants and plant parts
- Freshen and disinfect
 - Tea tree EO anti fungal, anti bacterial (strep and pneumococci), 100% more powerful than carbolic acid (poisonous to touch), natural material
 - > Peppermint EO kills broad spectrum of germs
 - Eucalyptus, Lavender, Lemon, Thyme antiseptic and antibacterial
- Use only true essential oils
 - 'Distilled' or 'synthetic' are processed and used mainly for fragrances

Non Toxic Cleaner Recipes

- All purpose cleaner
 - > Fill large bottle (~16 oz.) with equal parts vinegar and water
 - > 20 drops of essential oil (Tea Tree, Peppermint...)
- Oven cleaner
 - Cover oven floor with baking soda
 - Spray with water every few hours to keep damp or spray really good before bedtime
 - Mess is ready to wipe out
- Glass cleaner
 - Large bottle (16 oz.)
 - > 1/3 c. vinegar and rubbing alcohol
 - > Fill rest of bottle with tap water
 - Use newspaper (and gloves)

Non Toxic Cleaner Recipes

- Bath salts
 - > 1:1 Epsom salt and Baking soda
 - > Few drops of favorite essential oil
- Toilet bowl cleaner
 - > Sprinkle baking soda in bowl and pour vinegar in
 - > React let sit for at least 10 min
 - Scrub with regular scrub brush
- Scouring scrub
 - > 1 c. baking soda
 - > 1 tsp. castile soap
 - > Several drops of essential oil (Tea tree, eucalyptus)

Non Toxic Cleaner Recipes

- Drain cleaner
 - ➤ Pour ½ c. baking soda down drain
 - > Followed by 1 c. vinegar
 - > Let sit at least 15 min. or overnight
 - Rinse with hot or boiling water
- Lime/Calcium remover
 - Soak towel in vinegar and wrap around item (faucet, showerhead, etc.)
 - Sit for couple hours or overnight, then rinse
- Air freshener
 - Fill bottle with purified water
 - > 10 drops of favorite essential oil

Nonpoint Source Pollution

- Scattered, wide spread sources of pollution
 - Excess fertilizer/herbicide/insecticide use from agriculture and residential areas
 - Oil, grease, toxic chemicals from urban runoff and energy production
 - > Sediment from improperly managed construction sites
 - > Salt from roads and irrigation practices
 - Bacteria and nutrients from livestock, pet waste and faulty septic systems

Nonpoint Source Pollution

- Subtle and progressive impacts
 - Increase in water temperature and decrease in clarity
 - Increase in nutrient (N/P) and decrease in dissolved oxygen levels
 - Fish population decline, sediment increase in water

Nonpoint source pollution is the Nation's largest source of water quality problems

How you can help reduce NPS

Agriculture

- > Manage animal waste
- Use pesticides and fertilizers appropriately
- Conservation practices

Urban Stormwater Runoff

- Keep litter, pet waste, grass clippings, leaves and debris out of street gutters and storm drains
- > Apply lawn chemicals appropriately
- Clean up and dispose of used oil, paint and other HHW properly



You're street is Riverfront Property...

- ♦ Your rooftop is connected to your gutter
- ♦ Your gutter is connected to your downspout
- ♦ Your downspout is connected to your yard
- ♦ Your yard is connected to your driveway
- Your driveway is connected to your street
- Your street is connected to your storm drain
- Your storm drain is connected to a river

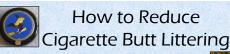


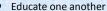
Most frequent littered item - 65%

> 2.3 million butts littered every minute

Harmful to environment and waterways

- Takes more than 20 years to biodegrade, but does not go 'away'
- ➤ Made of cellulose acetate nasty plastic
- Leaches toxic chemicals cadmium, lead, arsenic, zinc, tar and nicotine in waterways and ecosystems
- Some species think its food butts found in stomachs of birds, fish, sea turtles, etc.





- Encourage businesses/cities to keep ash receptacles
- Don't throw out of car window
 - Car ashtray, portable ash tray, pocket ashtray











River Friendly Lawn Care

- EPA finds that residential lawns use 10X more pesticide/herbicide/fertilizer than a conventional field of corn
- These chemicals are showing up in our reservoirs around the world creating dead zones in our waters

River Friendly Lawn Care

Pesticides and Synthetic Fertilizers

- Most derived from fossil fuels
- Did not exist before WWII
 - ➤ Anhydrous ammonia used to harden ground for aircraft runways in WWII
 - ➤ High levels of nitrate burns out organic matter and compact soil
- Destroyed soils over the last 75 years...

River Friendly Lawn Care

Salt and Soil Don't Mix

- Synthetic fertilizers are salt-based and run off
- Salt kills microbes
 - Microbes are needed to make nutrients plantavailable
 - Plants unnaturally altered by getting 'addicted' to salt-based fertilizers
- Organic fertilizers do not run off
 - Stays on soil until dissolved by microbes

River Friendly Lawn Care

- Repeat use of synthetic (salt-based) fertilizers leads to misconception that organics don't work
 - > Pests LOVE fluorescent green lawns
- ♦ Healthy organic lawn will:
 - Use less water (up to 50% less, says EPA)
 - Be more resistant to pests and disease
 - Have less competition from weeds
 - Have a healthier growing cycle (no 'force feeding')

River Friendly Lawn Care

How to read a label

- ♦ N → Nitrogen → green
- ♦ P → Phosphorus → roots, shoots, flowers

Organic or not...

- ♦ Mow minimum 3" height
- Use mulching blades

River Friendly Lawn Care

Organic Lawn Care for Pests

- Neem Oil
- Soap Spray
- Rosemary Oil mixes for grubs
- Nolo Bait for grasshoppers
- Sluggo Plus for snails, slugs, pill bugs, earwigs
- Natural predators ladybugs

River Friendly Lawn Care

Organic Lawn Care for Weeds

- Mulch or ground cover
- Iron colloid (new product)
- Corn gluten meal pre emergent
 - > Dandelions, crabgrass
- Burn out sucks moisture from plants
 - Horticulture vinegar 20% acidic vinegar
 - Clove oil based

River Friendly Lawn Care

Nontoxic weed killer

- 1 gallon vinegar
- 1 lb. salt
- 8 drops dish soap
 - Add dish soap first, then vinegar and salt to spray bottle
- Point at weed, not spray

Creeping Charlie

- 5 Tbl borax
- Warm water
- Mix in ~1 L spray bottle and shake to dissolve Don't forget to LABEL



Composting

- ♦ Compost is decomposed organic material
- Reduce watering needs
- Provides many essential nutrients
- Provides soil structure
 - · Improves aeration and drainage
 - · Improves clay soils for gardening
- ♠ Reduction in garbage volume
- ♠ Reduces/eliminates need for chemical fertilizer
- Helps control weeds
- ◆ Too many benefits to list here.....

Composting

- Styles of composters
 - Open style simple and loosely encase compost pile
 - Closed style enclosed containers (box, tumblers)
- Advantages and disadvantages to each style
- Worm composting can be done indoors!!!
 - > Vermicomposting



Compost Recipe

1 part Green: 4 part Brown

- Examples of GREEN: green leaves, coffee grounds and filters, tea bags, plant trimming, fruit (including dropped apples), vegetable scraps, egg shells and fresh grass clippings
- Examples of BROWN: dead plants, sawdust from untreated lumber, twigs (very small), dried grass, weeds, straw and leaves

Water – allows microbes to grow and help decompose material

Air – aids in decomposition and controls odor

Compost Tips

- Needs to be done batch by batch
 - Pile will decrease once decomposition starts; adding to this pile will reset the clock for that batch
- Maximize compost time by stirring at least once a week
- Finished compost is about half the volume from beginning, but much denser
- When finished: look, feel and smell like rich dark soil and cannot distinguish original contents

A Little History on Turf Grass

- Late 18th Century from French and English designers
- Perception as a necessity has outgrown it's practicality
- May not be best option when considering everything that goes into traditional turf grass
- Minimum of 24 hours spent mowing each growing season
 - One extra day of VACATION!

Turf Grass - Alternatives

Ask yourself - what do you want out it?

- Ground covers more colorful/sustainable
 - Dwarf perennial grass seed mix: English daises, low growing clover, dwarf yarrow
 - Herbal mixes: chamomile, alyssum, other herbaceous plants with pleasant smell







Turf Grass - Alternatives

Trees/Shrubs

- Will hold back 100+ gallons of water from a rain event (depends on size)
- Help water quality, even in densest urban areas
 - > Slows run off through infiltration
 - > Filtration
 - > Interception
 - > Evaporation
- Non-stormwater benefits
 - Cleaner air, reduction of heat island effect, Carbon sequestration, noise reduction, social benefits

Turf Grass – Alternatives







Turf Grass – Alternatives American Plum Red Rocket Maple Crabapple

Water Wise Landscaping

- Rain gardens and Bioswales
 - Low maintenance garden that takes advantage of rainfall and stormwater runoff in its design and plant selection
- Xeriscaping
 - Wise use of water-efficient landscaping and the utilization of plants better adapted to local climatic and soil conditions
- Native Planting by Hyrdo-zones
 - Provides attractive and environmentally friendly landscape while reducing water and maintenance requirements

Rain Gardens/Bioswales

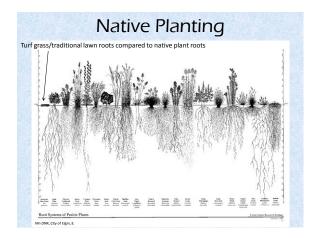


Xeriscape

What it is NOT:

- Large areas of gravel or rock
- Prickly vision of a desert landscape
- More gray than green
- All dry and dusty
- A 'zero'-scape





Rain Water Harvesting

"Collection systems collect and store rainfall for later use" (EPA)

- Passive Rain Water Harvesting
 - Rain gardens, bioretention swales (bioswales), porous pavement
- Active Rain Water Harvesting
 - Rain barrels, cisterns, tanks

Rain Barrels (cisterns, tanks)

Not a new concept

How much will my rain barrel collect?

 1" rainfall + 1000 ft² roof = 600+ gallons of stormwater

Benefits

- Save water, energy, money
- Happier (& healthier) plants
- Building protection
- Flexibility
- Reduce stormwater runoff



Make Your Own Rain Barrel Workshop Thursday April 30th 6PM Lindenwood Main Shelter





Water Wise Irrigation

- Two major causes of pollution related to irrigation
 - > Runoff
 - Leaching
- Both caused by over-watering!!!
 - > Run times too long
 - > Broken or faulty equipment
- Know soil filtration rates
 - Clay soil filters < 0.25 inches per hour</p>

Water Wise Irrigation

- Reset irrigation times 3X year
- Water at a plant healthy rate
 - Weather based controllers
 - Soil moisture sensors
 - Advanced feature controllers
 - > Low precipitation rate nozzles
 - > Sub surface (Drip) irrigation
 - > Point source irrigation

River Friendly Yard Management

- Scoop Your Poop!
 - > Fargo Community Garden example
- Pool discharge in F-M
 - > Do not add chemicals for at least three days
 - > Drain onto porous surface or sanitary drain
- Wash cars on grassy areas with phosphorus free detergents
- Repair/stabilize exposed soil with native vegetation

River Friendly Yard Management

 Keep grass clippings off streets, sidewalks and riverbanks

➤ Don't spray – SWEEP

NEVER put grass clippings or cut logs on riverbanks





Impervious Surfaces

- Impervious Surfaces
 - > Material on land which water cannot infiltrate
 - Concrete, asphalt, metal, brick
- How does this affect our water resources?
 - > Increase stormwater runoff
 - Stormwater carries NPS
 - > Decrease amount of groundwater recharge
 - > Erodes stream banks siltation/sedimentation
- Studies find that water quality degrades as impervious surfaces increase
 - Significant impairment when only 10% watershed is impervious surfaces

Alternatives to Impervious Surfaces

- Direct rainwater to vegetated areas of yard
 - > Crown driveways and sidewalks
- Plant more trees/shrubs around property border
- Encourage local government to adopt ordinances to protect water quality
 - > Detention basins for new developments
- Use alternative material
 - Gravel, interlocking cement pavers, crushed seashells
- Use pavement alternatives....

Pavement Alternatives

Pervious concrete/asphalt

- Looks like typical concrete/asphalt
- Made with many void spaces
- Water filters through product

 Typically reduces the amount of deicing product needed

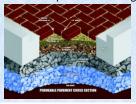




Pavement Alternatives

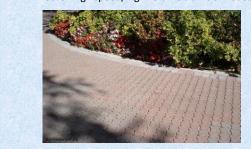
Permeable V Porous V Pervious Pavers

- Permeable water goes around pavers and filters through open spaces between pavers
- Porous surface with "holes" like a cellular grid system that allows vegetation to grow in-between
- Pervious stormwater percolates through the surface



Permeable Pavers

- Best for Roads, Parking lots, Walkways
 - ➤ Not for high speed/high volume traffic on roads



Porous Pavers

- Provides grass reinforcement, ground stabilization, gravel retention
- Great for parking lots
- Has been used in agriculture settings



Pervious Pavers

- Highest water infiltration rate
- 10X pervious concrete 90X permeable pavers
- Allows grass and tree roots to breathe



GrassPave and GravelPave

- Filter airborne and surface contaminants through bioremediation (GrassPave)
- Sand is best medium to get water/nutrient to plants
- Excellent for tree preservation
- Regular gravel roads become impervious over time
- Flexible good for our frigid climate
- Stronger than concrete or asphalt
 - DC10 Jet
- Made with 100% recycled plastic!
- Often eliminates need for other drainage systems
- Study shows \$56K savings over asphalt over 20 years

GrassPave and GravelPave

Best used for:

- Fire lanes
- Parking lots
- Helicopter Pads
- Golf Cart Paths
- On-street Parking
- Driveways
- High foot traffic areas
- Storage Yards
- Loading Docks
- And so many more.....



GrassPave and Gravel Pave



Deicer

- Same salt that is on your table
- Introduced as deicer in 30s, took off in the 60s
- 10+ million tons used every year on roads
- Salt does not work temperatures below 20-25°
- Gives salt tolerant plants an upper hand
 - (usually invasive/aggressive)
- Know your salt-zone risk
 - Salt tolerance of plants 5-10 feet from sidewalk and driveway
 - > Avoid using any product with chloride
- Concerns of high sodium concentration in our waters

Deicer - Alternatives

- Shovel snow before it accumulates
- Sand can be used as traction –clean up afterwards
- Birdseed for traction; Do not use Kitty Litter or ashes
- Use less toxic deicer
 - CMA calcium magnesium acetate apply prior to ice/snow storm
 - ➤ KA potassium acetate effective at lower temperatures than CMA
 - Calcium chloride still a chloride, but used in smaller amounts
 - ➤ Urea DO NOT USE considered a nutrient

Other ways to help our water resources

- Participate in local stream clean-up
- Use cloth/reusable bags for shopping/grocery
- Take child/friend on river recreation outing
 - ➤ Race the Red canoe/kayak races
 - > Fishing clinics
 - ➤ Catfishing experience on your own or with a guide
- Explain importance of water stewardship and effects of personal actions on our water resources
- Volunteer with a local non-profit

Resources

