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A New Runoff Management Technology...

Prairie Vegetation STRIPS

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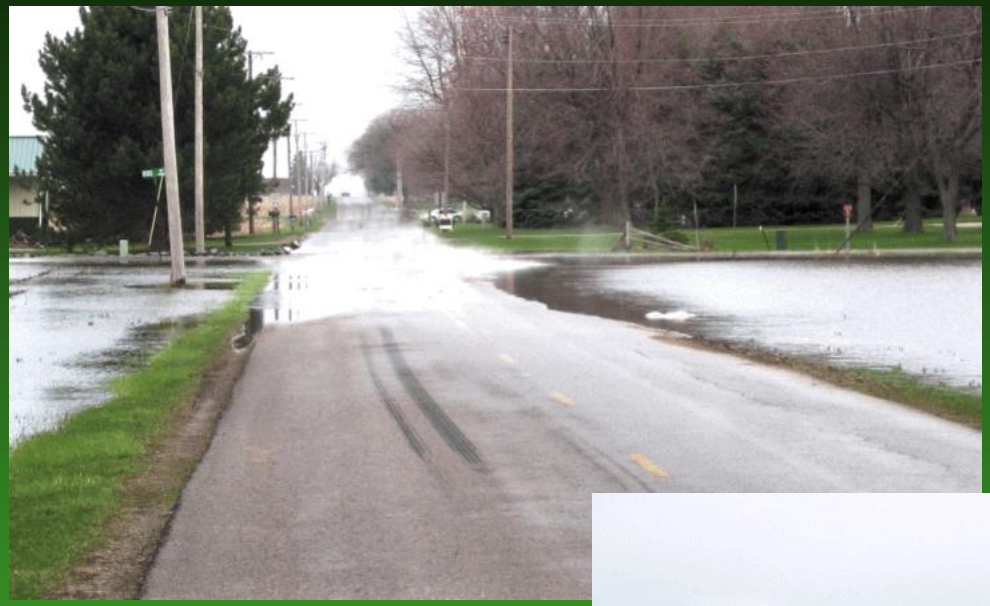
Stormwater Runoff Problems



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Stormwater Runoff — BIG Challenges

— We Have Solutions —

- Major Storm Events – runoff cannot be stopped.
- Runoff Can Be *Managed* – runoff slowed, absorbed.
- Unique Prairie Biology + Environmental Engineering – slows and retains storm runoff with ecological and economic sustainability.
- Achievable — low installation and maintenance costs; reduced set-aside acreage.

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Stormwater Runoff Problems

Conventional Practices:

1. Grass Filter Strips.

ADVANTAGES:

a) Moderately slows runoff velocities.

b) Inexpensive to install.

DISADVANTAGES:

a) Runoff often diverted away or around grass filter strips.

b) Ineffective in large storm events.

c) Limited sediment retention with reduced

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Stormwater Runoff Problems

Conventional Practices:

2. Grass Swales.

ADVANTAGES:

a) Can slow runoff velocities and slightly reduce volumes.

DISADVANTAGES:

a) Cannot take runoff from large accumulation acreages.

b) Can be expensive to design and install.

c) Weeds and brush must be controlled.

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Stormwater Runoff Problems

Conventional Practices:

3. Rain Gardens

ADVANTAGES:

a) Can hold roof, yard, and driveway runoff.

DISADVANTAGES:

a) Require intensive maintenance; must be “gardened.”

b) Suitable only for residences and small sites.

c) Prohibited by some zoning regulations.

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Stormwater Runoff Problems

Conventional Practices:

4. Retention/Detention Ponds

ADVANTAGES:

a) Can hold large volumes of runoff.

b) Slow water release.

DISADVANTAGES:

a) Expensive to design and construct.

b) Are large facilities, often too large for urban sites.

c) Weeds and brush will invade; require continuing control.

d) Mosquitoes and exit clogging can be problematic.

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Stormwater Runoff Problems

Conventional Practices:

5. Porous Pavements

ADVANTAGES:

a) Can reduce or eliminate parking lot runoff.

DISADVANTAGES:

a) Expensive.

b) Require porous substrates.

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A New Runoff Management Technology...

Upland Prairie Nutrient Retention Strips

Strips of tallgrass prairie; intercepting, filtering, and slowing stormwater runoff — with remarkable outcomes.

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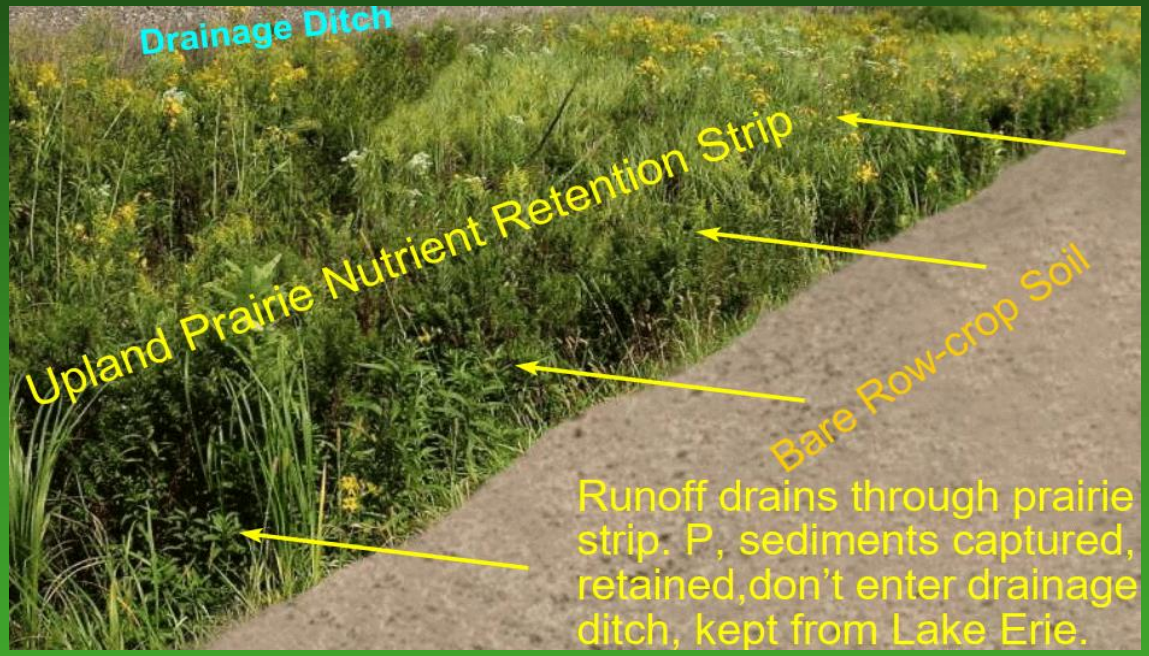
A New Runoff Management Technology...

Prairie STRIPS are superb — intercept, filter, percolate, and slow surface runoff like nothing else.



Prairie vegetation has <u>unmatched abilities</u> to capture & retain sediments and algal nutrients.

— Because of unique root structures. —

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John Blakeman, of Meadow Environments, has 40 yrs of experience growing, managing Ohio prairies. Manages hundreds of acres for NASA at Plum Brook Station and other private sites.

Tallgrass prairie vegetation grows well in Ohio.

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It works because of prairie roots.

Big Bluestem prairie grass.

Dense stems and leaves filter and retain sediments and slow runoff.

Extremely dense roots chemically and physically bind to algal nutrients and retain them. Roots open the soil deeply and allow infiltration.

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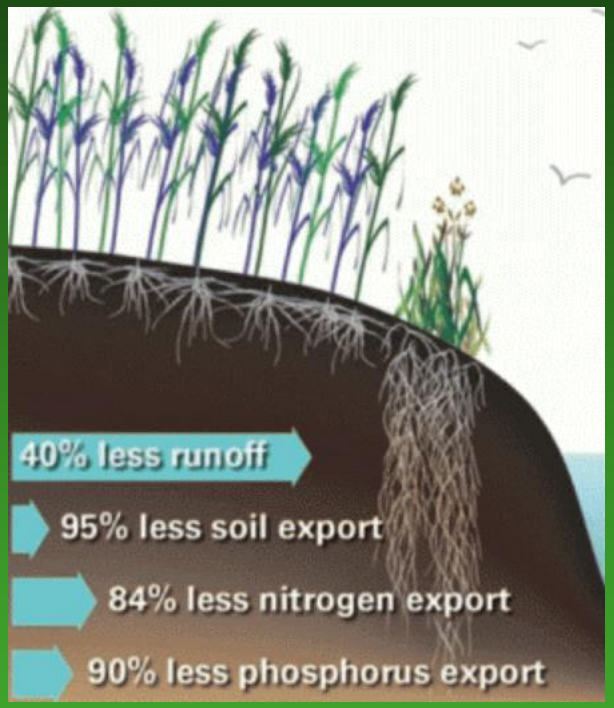
Iowa State University has years of prairie strip runoff analysis:



Edge-of-field Prairie Strip

1. Runoff reduced 40%.
2. Soil loss reduced 95%.
3. N runoff reduced 84%.
4. P runoff reduced 90%.

Retention of P can stop Lake Erie algal blooms.

Sediment retention can reduce harbor dredging.

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Uses:

1. Downslope borders of fields, parking lots, etc.
2. Advantageous vegetation for grass swales and filter strips. Superior runoff and sediment retention traits.
3. Can withstand the periodically wet soils of retention/detention basins.

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Designing Sites with Prairie Grasses & Forbs

1. Must be carefully planted in late fall or early winter on bare-soil site (using specific prairie planting methods).
2. Will take three growing seasons to mature. Must use early cover seed mix.
3. Prairies challenge many city “weed and grass” laws — thought to be too tall.
4. Must be rough-mowed once each year to suppress woody invaders.

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Designing Sites with Prairie Grasses & Forbs

Advantages:

1. Beautiful aesthetics in all seasons.
2. Retain massive volumes of water and sediments in planted area.
3. Long-lasting, low maintenance; require but single annual mowing.
4. Unaffected by drought, excessive rain, snow, ice, or cold.
5. Support honeybees, butterflies, etc.

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Community Storm Water Design Comparisons

	Soil & Water Retention	Installation & Maintenance Costs	Natural Aesthetics
Prairie Vegetation Designs	Strong	Low	Strong
Conventional Runoff Management Designs	Variable	Often High	Limited to None

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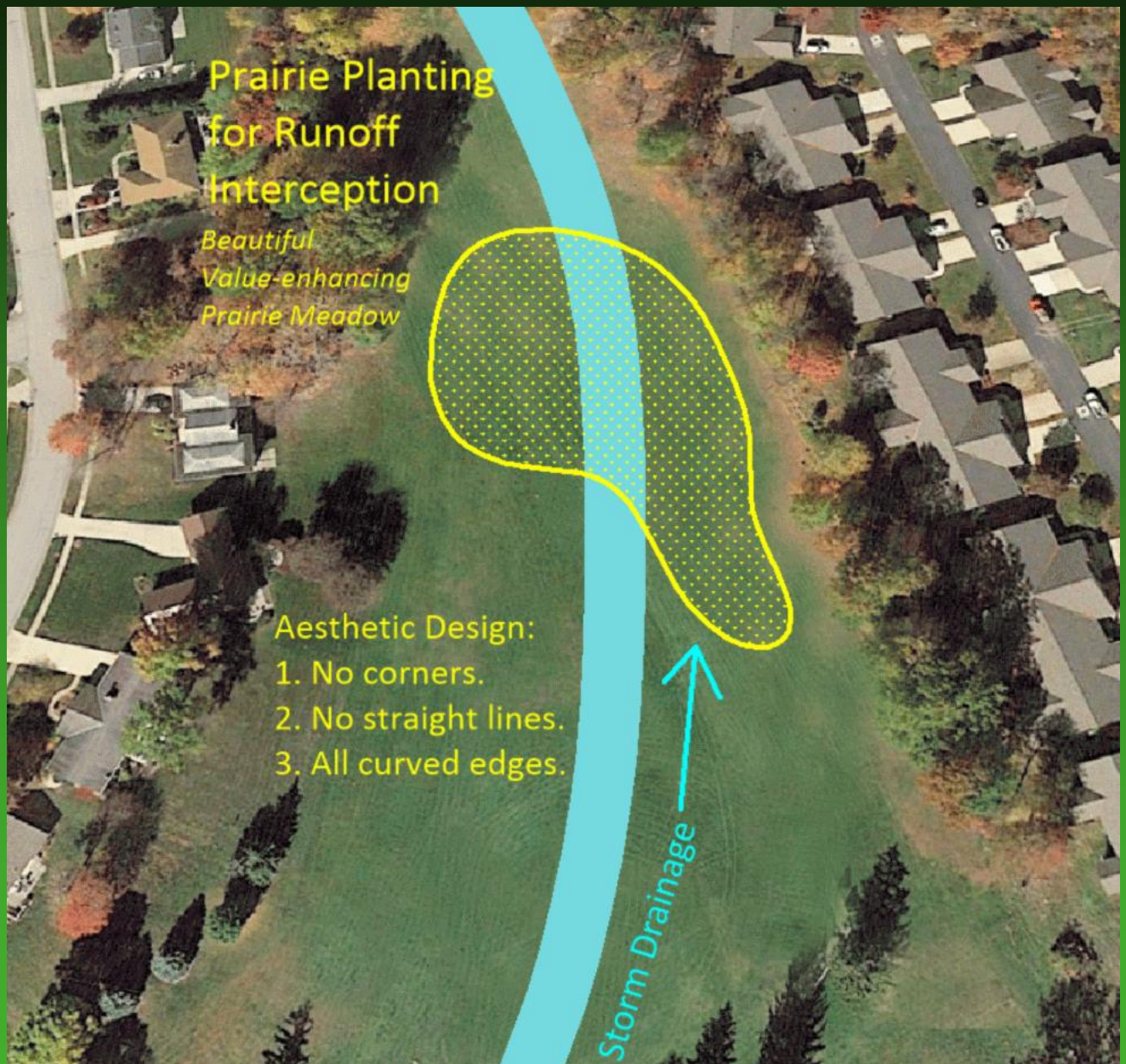
Model Design

Can enhance the function and aesthetics of swales, retention basins, filter strips, etc.



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The Issues, The Obstacles, ...The Solutions

Meadow Environments and UARF are ready to consult in design, engineering, and community planning to enhance storm water management, focusing on new efficiencies, aesthetics, and community acceptance.

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