



UNIVERSITY OF MINNESOTA | EXTENSION
Driven to DiscoverSM

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University Extension



Saturated Buffers: Beyond the Drawing Board

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Introduction – Ecosystem Services Exchange

- Design “manageable” tile systems
- Retrofit existing tile for management
- Nutrient Trading, Environmental Markets
- Certified Technical Service Provider for the NRCS

www.EcoExch.com



We live and work in a
drained landscape.

...

How do we help our local landowners
become better at managing their water
and improving its quality?

Give them better tools.



What tools are available?

...

Saturated Buffers – They look the same to me...



Photo courtesy Agri Drain Corp.

Saturated Buffers – How they work

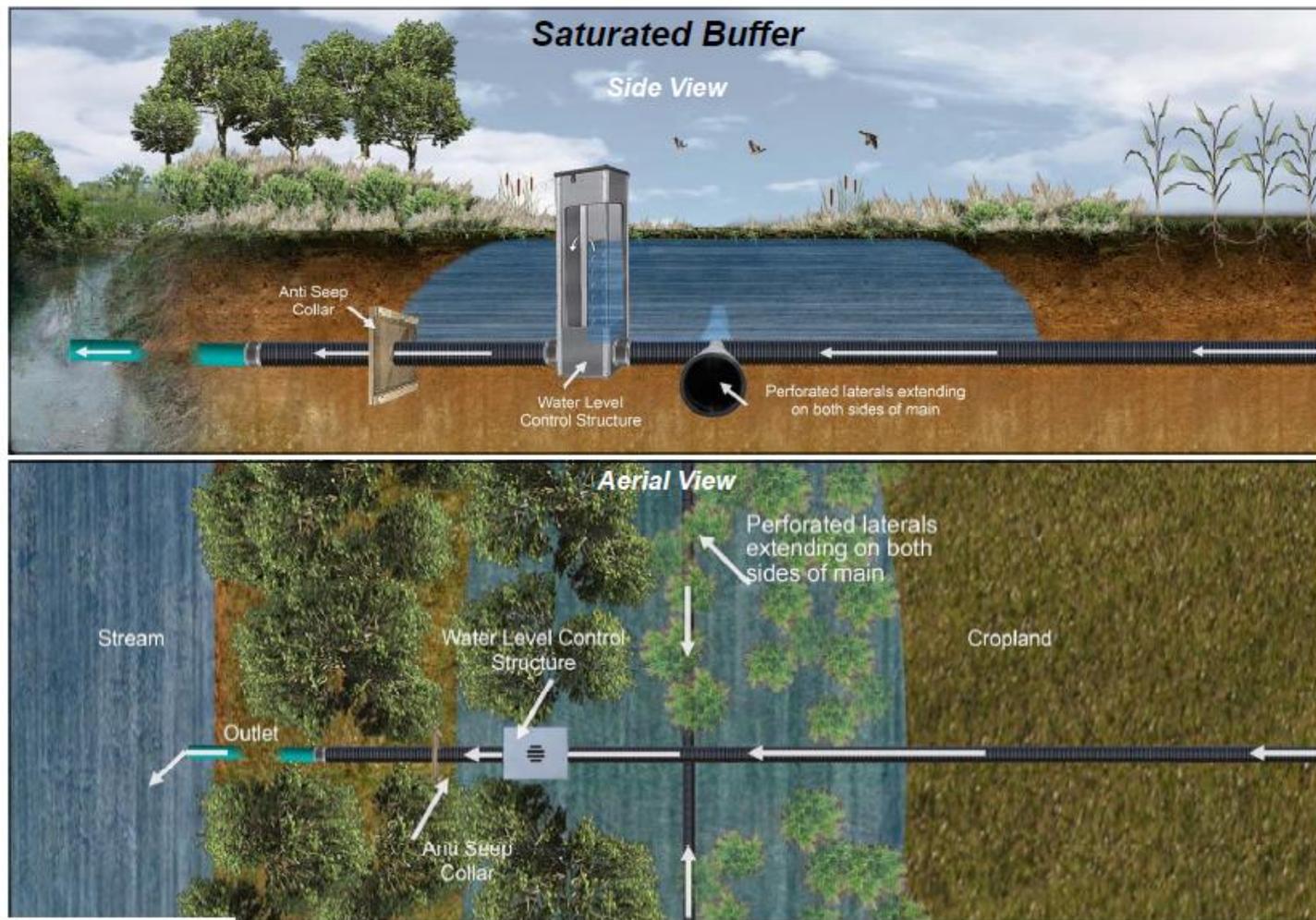


Photo courtesy Agri Drain Corp.

Saturated Buffers- Do they work?

- Pilot site – Bear Creek (Iowa)
- Initial results look great
- **Will they be effective in other locations as well?**



Ag Drainage Management Coalition

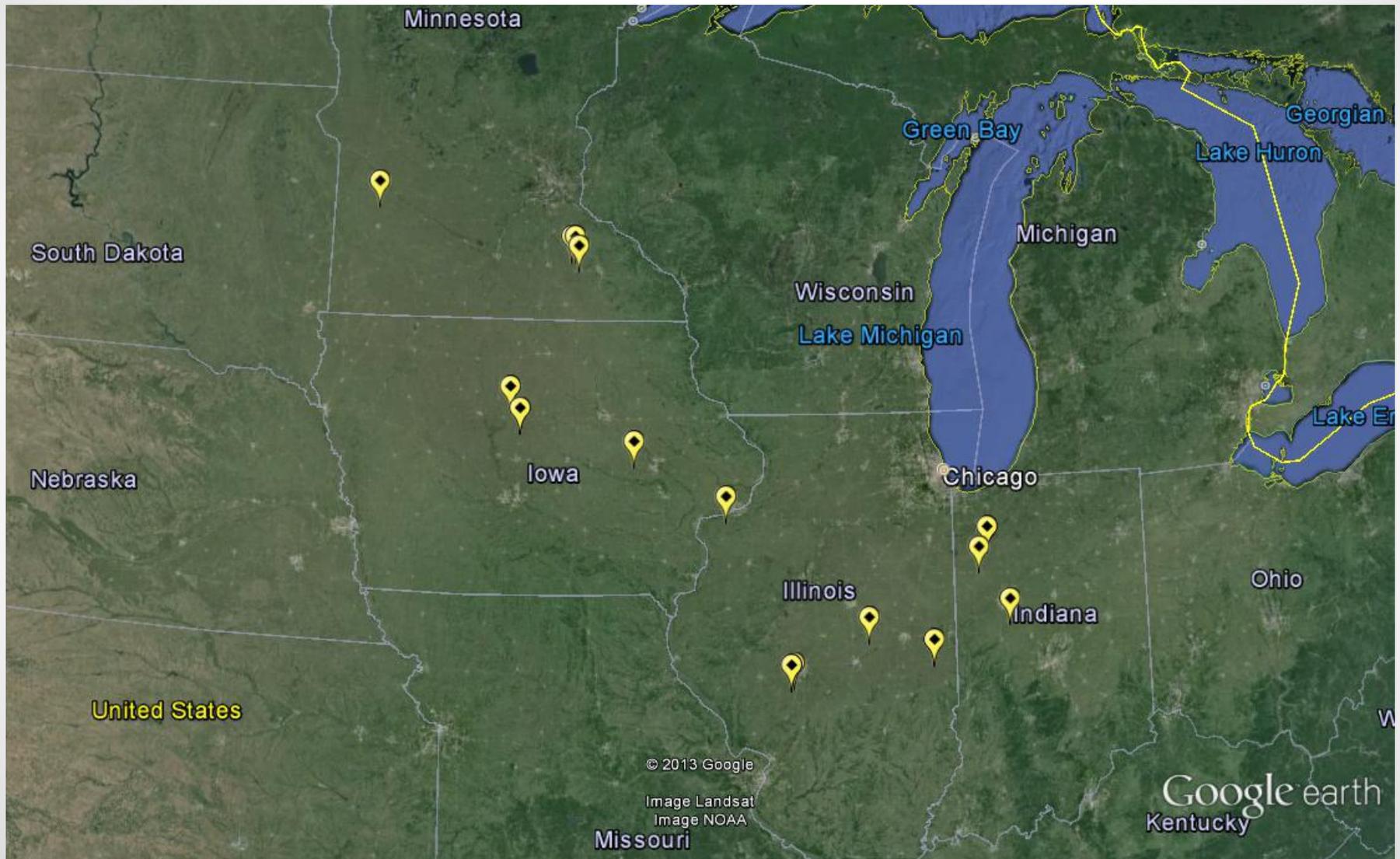
- Industry-led organization addressing water quality and drainage concerns
- Work with USDA and universities on research and development of new technologies
- Provide training workshops to farmers and contractors

Saturated Buffer Demonstration Project

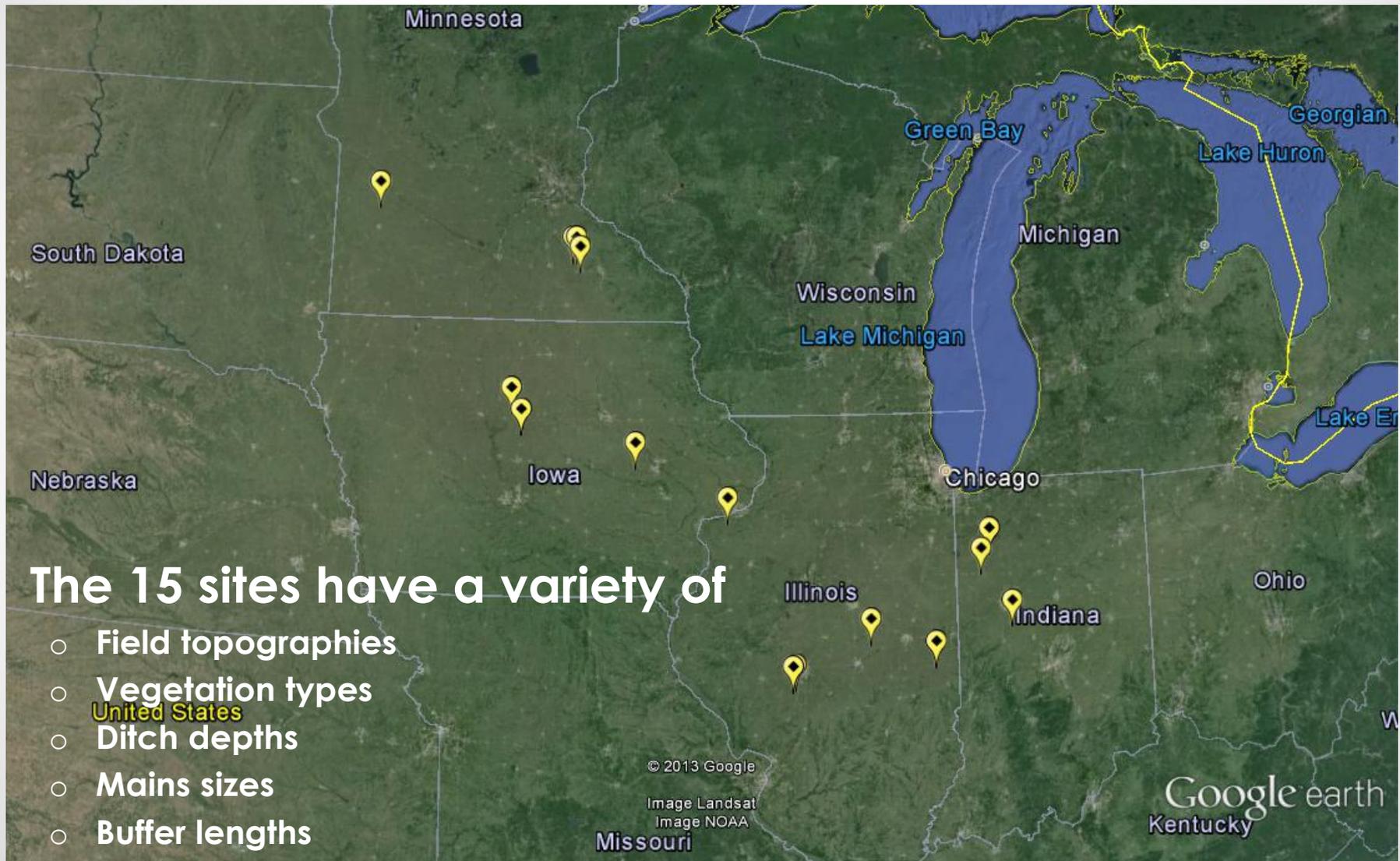
- ADMC was awarded a 3-year CIG
 - Indiana, Illinois, Iowa and Minnesota
 - Nine sites
- FSA awarded additional funds
 - Six additional sites



Saturated Buffer Demonstration Project



Saturated Buffer Demonstration Project



The 15 sites have a variety of

- Field topographies
- Vegetation types
- Ditch depths
- Mains sizes
- Buffer lengths

Saturated Buffer Demonstration Project

- We will monitor
 - Flow
 - Water Quality (N and P)
 - Soil Parameters
 - Stream bank movement



Flow Monitoring - Method

- 3-Chambered structure
 - Flow from field
 - Bypass flow
- Use structure as a weir
 - V-Notch stop logs
 - Level measured with ultra-sonic sensor



Water Quality

- Bi-monthly grab samples
- Collected at structure
- 3 or 4 groundwater well transects
- Shipped same-day to Ames, IA for analysis
- Both N and P will be measured



Demonstration Project: Where are we now?

...

Current Status

- The 15th buffer was installed in June 2013
- All sites are instrumented and recording
- Water quality sampling has begun
 - Samples collected by local partners
- No data ready to share yet, but stay tuned!!!





Will a saturated buffer work on my farm?

...

What does the field need to be like?

- Interim NRCS standard 739
 - Vegetated Subsurface Drain Outlet
- Most important site requirements
 1. Buffer strip – grass, trees, etc.
 2. Tile main to intercept
 3. Hydraulic gradient – someplace for the water to go
- Other important factors
 - Soil conditions
 - Buffer dimensions/topography
 - Field Topography

Soil Conditions

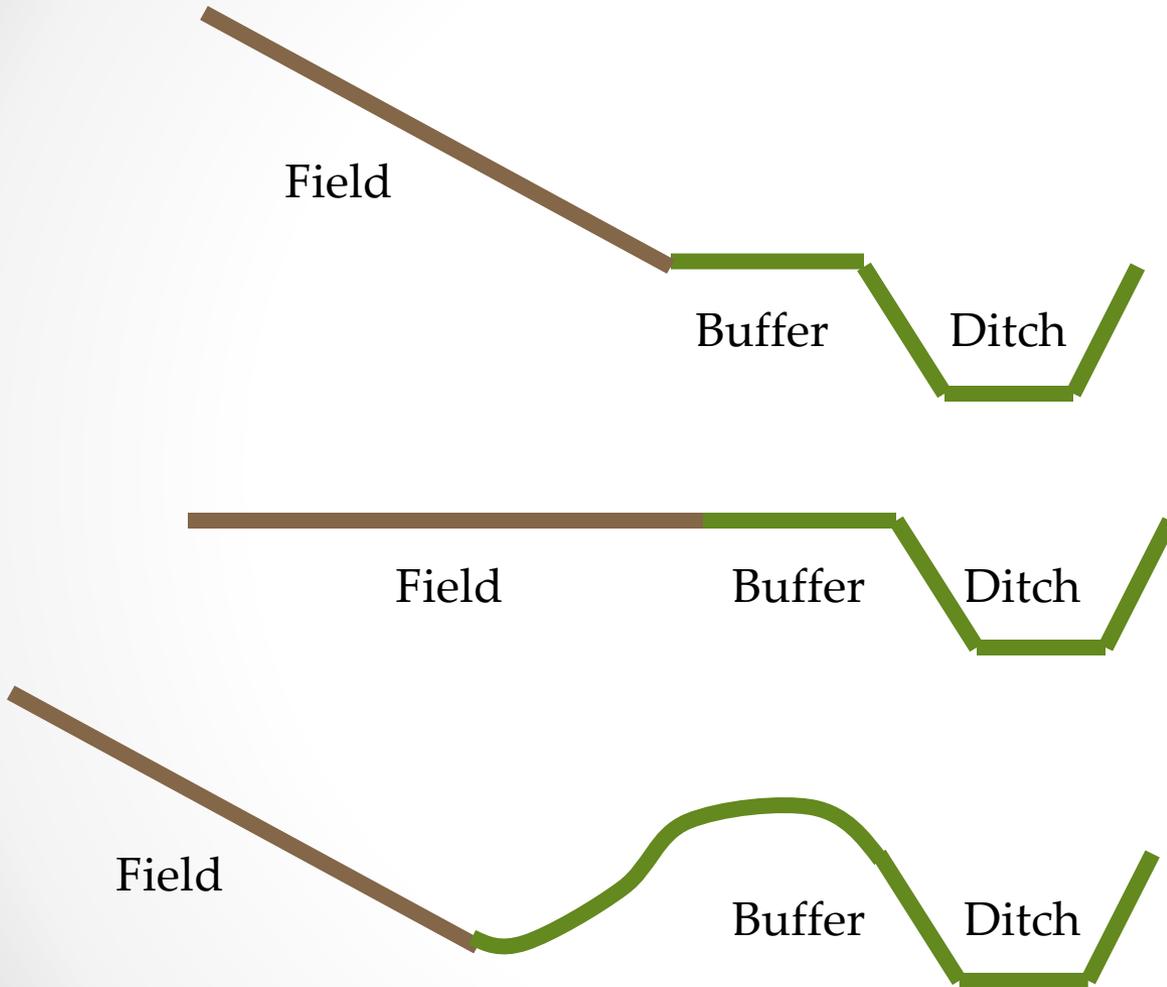
- Soil must allow you to maintain a high water table
 - Restrictive layer
 - Avoid sand/gravel lens



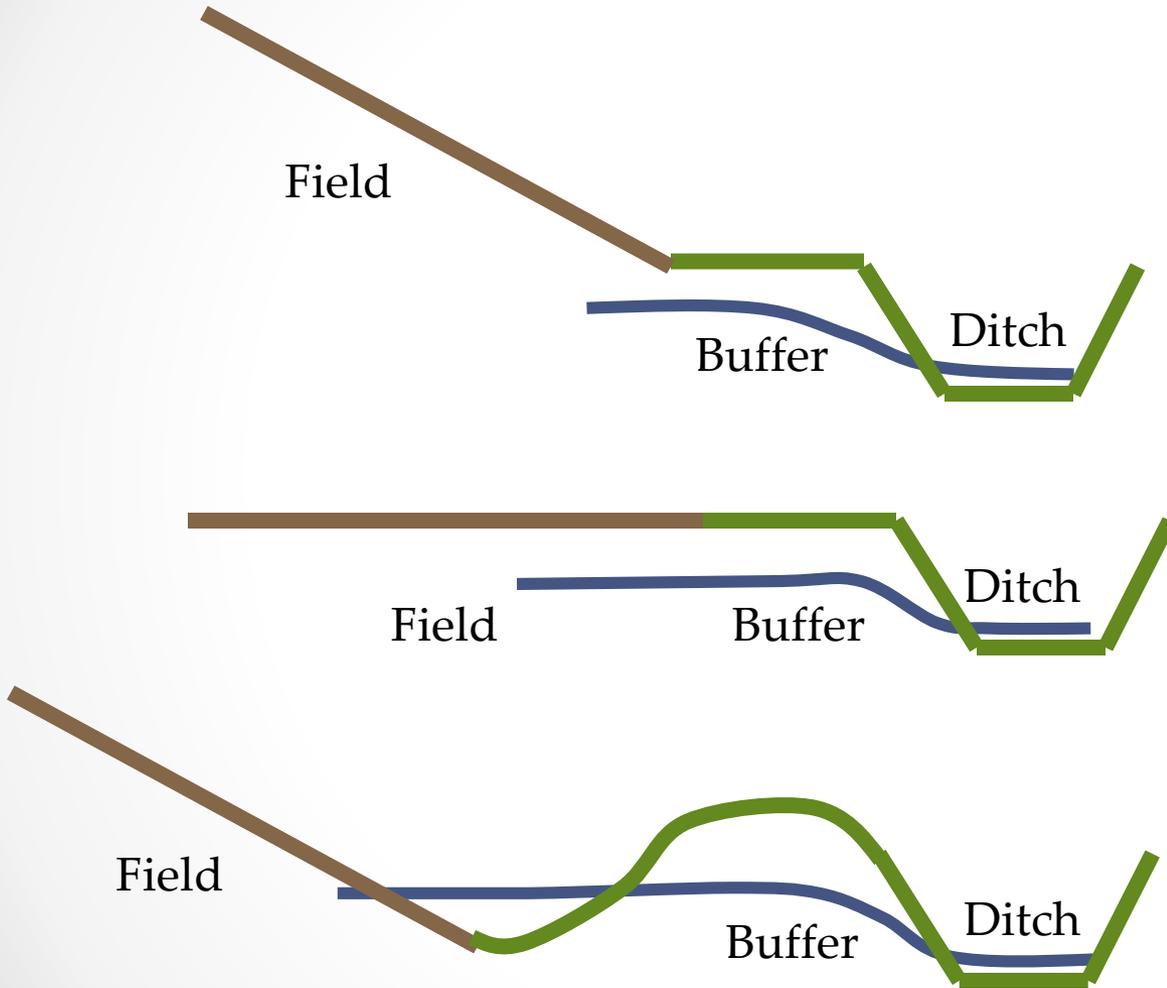
Buffer Characteristics

- At least 30 ft wide
- Well established vegetation
- Flat along the ditch
 - Up to 2 ft of elevation change along length of buffer
 - At least 300 ft long
 - Longer buffer may be needed for larger tile mains

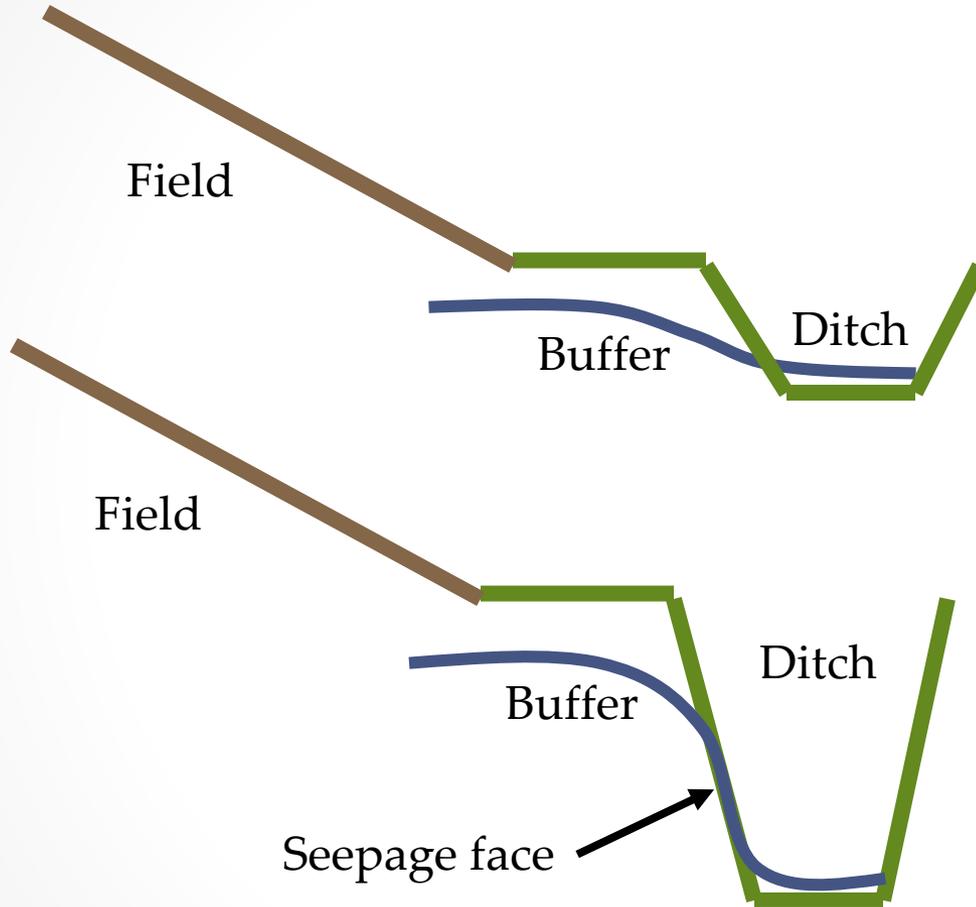
Field Topography



Field Topography



Another Consideration – Ditch Depth



Super! Now what do I
need to put one in?
...

Initial site review and design



Proper equipment



Control structure



Pipe



Ready to install



Conclusions

- Saturated buffers are a cost effective tool for improving water quality
- Simple to design, install, and maintain
- Tremendous potential for broad implementation

Questions?



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