Educating Producers About Manure Application

U. W. - Discovery Farms Program

Dennis Frame, Fred Madison
Co-Directors, University of Wisconsin–Extension

Discovery Farm Locations

Buffalo County

- Two paired basin sites (stream)
  - *Dairy, Beef, Poultry & Grain*

Iowa County

- Up/down stream and one field site
  - *Organic Grazing Dairy*

LaFayette County

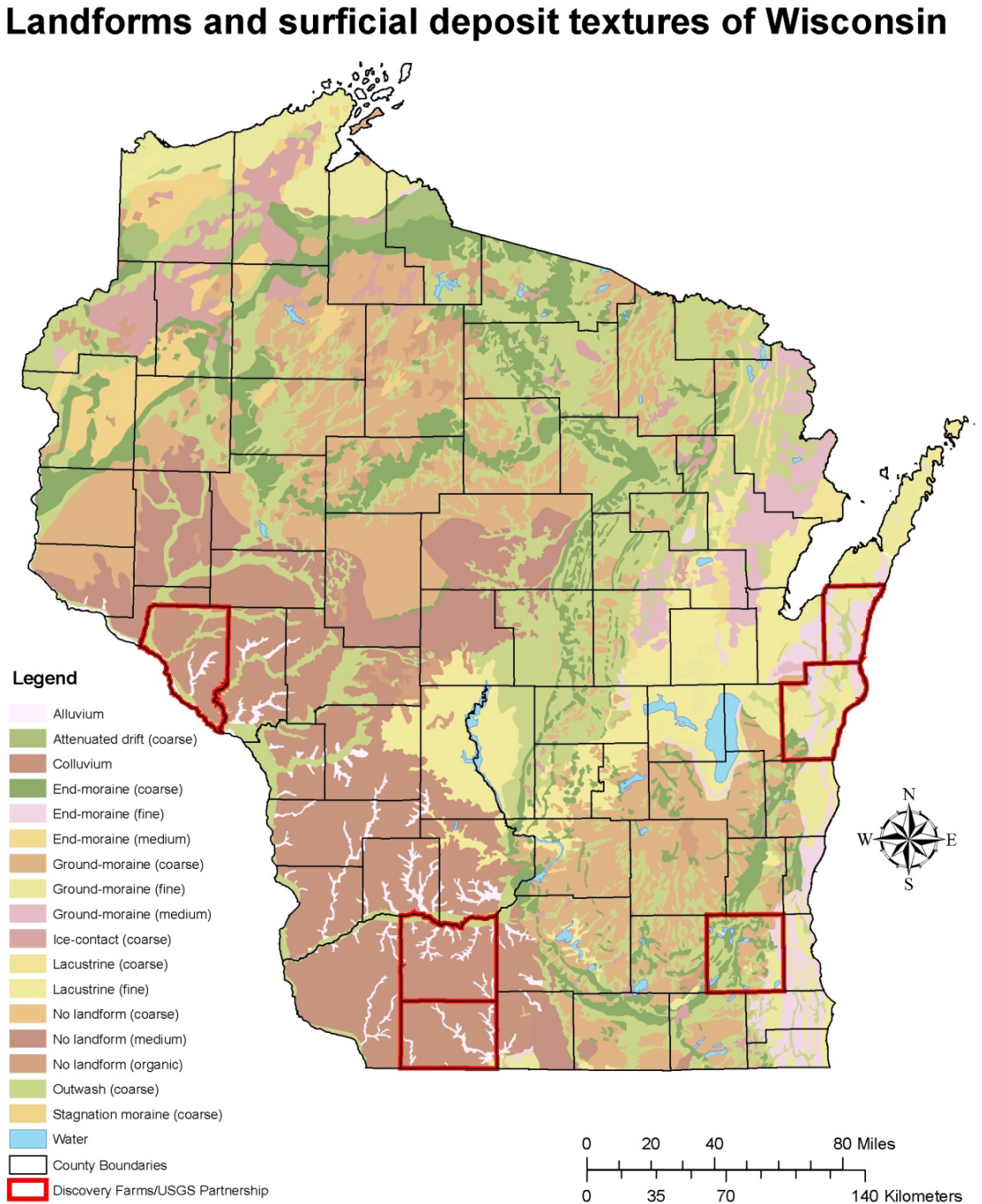
- Three paired basin sites (field)
  - *Beef Feedlot and Cash Grain*

Kewaunee County

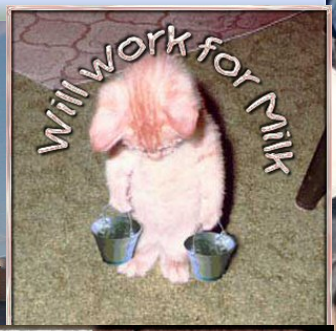
- Two paired basin sites (field)
- Two tile line sites
  - *1450 Cow Confinement Dairy*

Waukesha County

- Two paired tile sites, one surface site
  - *350 Cow Dairy – 30 day storage*



Monitoring Wisconsin's Agriculture



…the brains of the operation

Meteorological data: precipitation, wind speed and direction, air temperature, solar radiation, relative humidity, soil moisture and temperature

Identifying physical settings may be easy or very hard

- ✓ With few exceptions physical settings don't change
  - ✓Sinkholes
  - ✓Breaks in tile
  - ✓Springs

Identifying conditions are another matter

Critical Periods

- Our work has identified critical time periods when the risk of runoff is very high:
  - Snowmelt, rain on snow/frozen ground
  - Non-frozen soils that are close to saturation

Critical Runoff Periods

- 3 years of data (2004 – 2006) from seven sites
- No-till, tillage, and grazing operations
- Periods which are "best" for producers to apply manure coincide with the periods which are higher risks for runoff!

January 7 %	February 23 %	March 34 %
April	May 29 %	June 7 %
July	August	September
October	November	December < 1 %

Average percent of annual runoff

Frozen Ground

- On average 60 – 75% of the annual runoff occurs on frozen ground (rain or snow melt). Data from all our sites indicate that around 90% of the nutrient and sediment losses that occur in any given year happen before the 15th of June.

- Why not ban winter spreading?

- We believe it is more important to identify critical conditions rather than dates.

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Non-Frozen Period

- There are periods of vulnerability when runoff can be expected. Predicting these periods can greatly reduce the potential for nutrient and sediment losses.

- There are periods when the potential for runoff is minimal (during and after the growing season).

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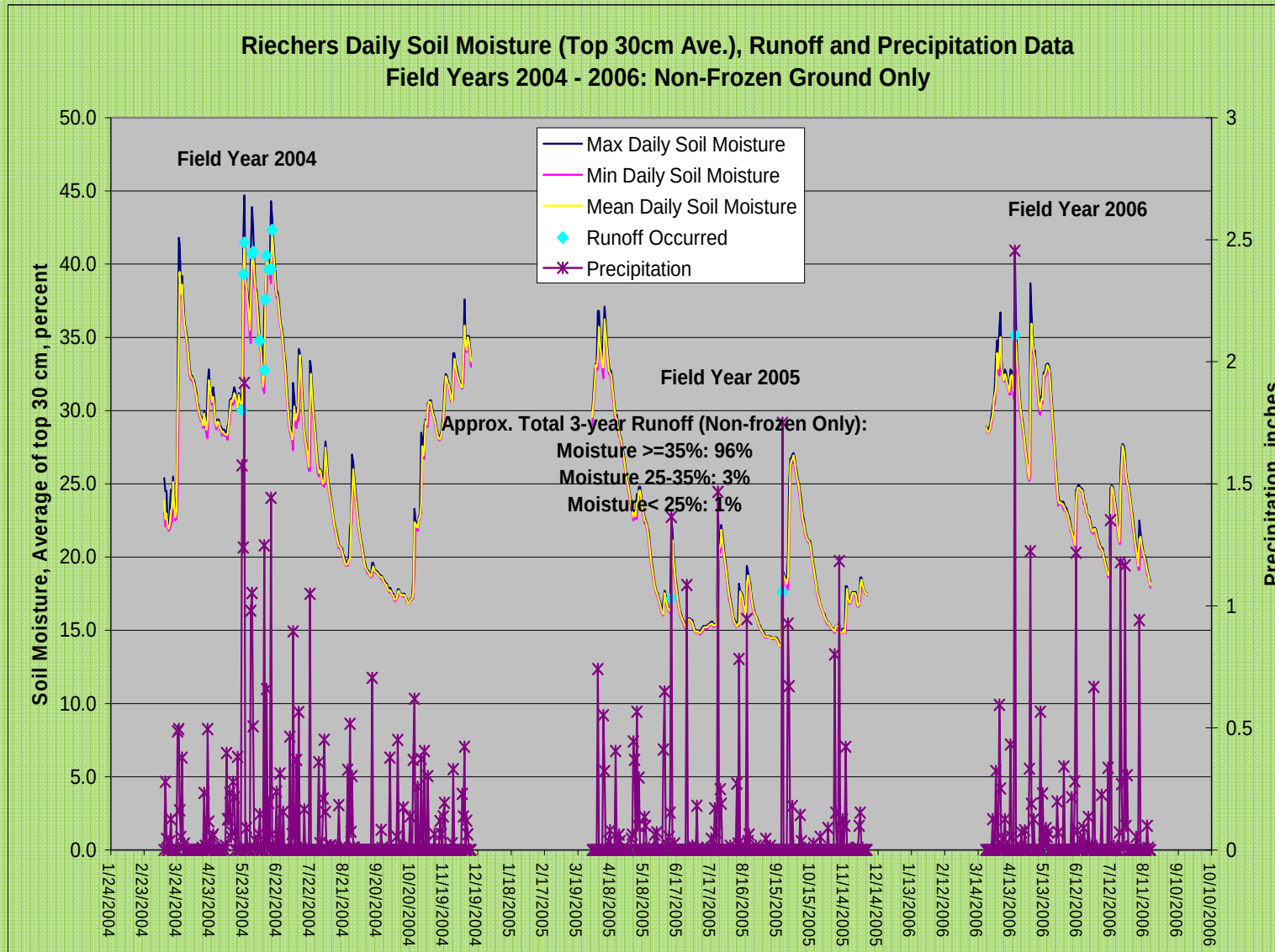
Data Summary:

96% of runoff events occurred with moisture > 35%

3% occurred with soil moisture 25 – 35%

1% occurred with soil moisture < 25%



Non-Frozen Period

- The goal is to develop a critical condition index that helps identify acceptable spreading conditions.
- Over time we should be able to estimate acceptable spreading rates.

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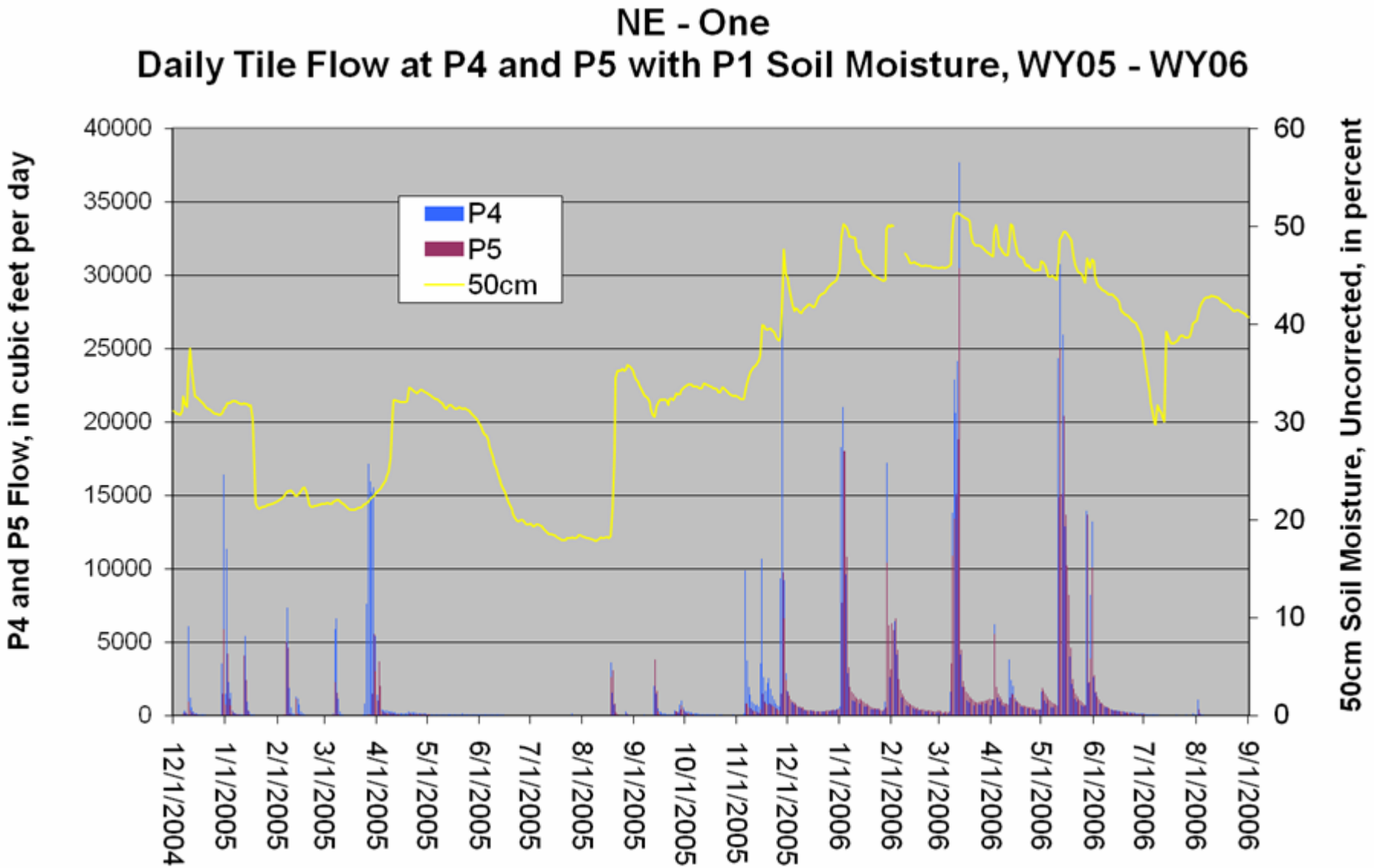

50% occurred when ground was frozen

Risk Reduction

- The goal is to identify critical conditions, time periods and farming systems that reduce nonpoint pollution.
- Water quality will only improve if practices are adapted and adopted on farms throughout the state.
- Practices must become second nature.

Conclusions

- Need additional on-farm research to identify acceptable application rates, methods and timing for manure, and other sources of nutrients
- Rates based on soil moisture holding capacity and soil moisture

Quote

- There is no nation so powerful, as the one that obeys its laws not from principals of fear or reason, but from passion.

- Author: Charles De Montesquieu 1689-1755,

French Jurist, Political Philosopher