

New York Phosphorus Runoff Index

Dissolved P index = P Source factor x P Transport factor (dissolved)
&
Particulate P index = P Source factor x P Transport factor (particulate)

**P indices for both dissolved and particulate P should be calculated.
Each must be below 100 to receive manure.**

Ranking Values	Site Vulnerability	Management
< 50	Low	N based management
50 – 74	Medium	N based management with BMPs
75 – 99	High	P applications to crop removal
≥ 100	Very High	No P ₂ O ₅ fertilizer or manure application

The New York P Runoff Index was developed by the NY P Index working group.

Current members include:

- Cornell University,
 - Dept. of Crop and Soil Sciences:
 - Karl Czymmek (PRO-DAIRY), Quirine Ketterings, Greg Albrecht
 - Dept. of Biological and Environmental Engineering:
 - Larry Geohring, Tammo Steenhuis
- Cornell Cooperative Extension:
 - Shawn Bossard, Dale Dewing
- Natural Resources Conservation Service:
 - Tibor Horvath, Bill Elder
- Department of Agriculture and Markets:
 - Jeff Ten Eyck

Past members include: Barbara Bellow (formerly with BEE), Jim Perry, Paul Ray and Fred Gaffney (NRCS), Ray Bryant (formerly with CSS, currently with USDA-ARS), and Dean Hively (Department of Natural Resources, Cornell University).

Phosphorus Source Factor

P Source Factor = Soil test P + Fertilizer P + Organic P

Site Characteristics	
Soil Test P (P_{ST}) Morgan's (lbs P/ac)¹	1.25 X Morgan's Soil Test P (lbs P/ac)

Fertilizer P application rate (P_{fa})	# P_2O_5 / acre			
Fertilizer P timing (P_{ft})	May – August 0.4	September – October 0.7	November – January 0.9	February – April 1.0
Fertilizer P method (P_{fm})	Injected or subsurface banded 0.2	Broadcast and incorporated within 1-2 days 3-5 days 0.4 0.6	Surface applied or broadcast and incorporated >5 days after application 0.8	Surface applied on frozen, snow covered or saturated ground 1.0
Fertilizer P	$(P_{fa}) * (P_{ft}) * (P_{fm})$			

Organic P application rate (P_{oa})	0.75 X # P_2O_5 / acre			
Organic P timing (P_{ot})	May – August 0.4	September – October 0.7	November – January 0.9	February – April 1.0
Organic P method (P_{om})	Injected or subsurface banded 0.2	Broadcast and incorporated within 1-2 days 3-5 days 0.4 0.6	Surface applied or broadcast and incorporated >5 days after application 0.8	Surface applied on frozen, snow covered or saturated ground 1.0
Organic P	$(P_{oa}) * (P_{ot}) * (P_{om})$			

¹ Convert Mehlich III P to Morgan P prior to calculating the soil test source factor.

Phosphorus Transport Factor for Dissolved P

Dissolved P Transport Factor = Soil drainage + Flooding frequency
+ Flow distance to stream

(if Dissolved P Transport ≥ 1 , then Dissolved P Transport = 1)

Site Characteristics				
Soil Drainage (from soil survey, unmodified due to application of drainage practices)	Well / Excessively well drained 0.1	Moderately- well drained 0.3	Somewhat poorly drained 0.7	Poorly / Very poorly drained 1.0
Flooding frequency (F)	Rare / Never > 100 years 0	Occasional 10 - 100 years 0.2		Frequent < 10 years 1.0
Flow distance to blue line stream as depicted on topographic map (in feet)² Intermittent Stream (dashed blue line) $D_{min} = 25, D_{max} = 200$ Perennial Stream (solid blue line) $D_{min} = 50, D_{max} = 300$	$D > D_{max}$ 0	$D_{min} < D < D_{max}$ $1 - (D - D_{min}) / (D_{max} - D_{min})$		$D < D_{min}$ 1.0

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(This is the same as above – in English rather than algebraic – do not use both)

Flow distance to blue line stream as depicted on topographic map (in feet)² Intermittent Stream = dashed blue line. Perennial Stream = solid blue line.	Intermittent Stream >200 feet Perennial Stream >300 feet ----- 0	Intermittent Stream 25 to 200 feet Perennial Stream 50 to 300 feet ----- Intermittent Stream $1 - (\text{Distance} - 25) / 175$ Perennial Stream $1 - (\text{Distance} - 50) / 250$	Intermittent Stream <25 feet Perennial Stream < 50 feet ----- 1.0
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Phosphorus Transport Factor for Particulate P

Particulate P Transport Factor = Soil erosion + Flooding frequency
 + Flow distance to stream + Concentrated flow
 (if Particulate P Transport ≥ 1 , then Particulate P Transport = 1)

Site Characteristics			
Soil erosion RUSLE	0.1 X Erosion rate (tons/acre)		
Flooding frequency	Rare / Never > 100 years 0	Occasional 10 - 100 years 0.2	Frequent < 10 years 1.0
Flow distance to blue line stream as depicted on topographic map (in feet)³ Intermittent Stream (dashed blue line) $D_{min} = 25, D_{max} = 200$ Perennial Stream (solid blue line) $D_{min} = 50, D_{max} = 300$	$D > D_{max}$ 0	$D_{min} < D < D_{max}$ $1 - (D - D_{min}) / (D_{max} - D_{min})$	$D < D_{min}$ 1.0
Is concentrated flow present?	No 0	Yes 0.2	

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(This is the same as above – in English rather than algebraic – do not use both)

Flow distance to blue line stream as depicted on topographic map (in feet)³ Intermittent Stream = dashed blue line. Perennial Stream = solid blue line.	Intermittent Stream >200 feet Perennial Stream >300 feet ----- 0	Intermittent Stream 25 to 200 feet Perennial Stream 50 to 300 feet ----- Intermittent Stream $1 - (\text{Distance} - 25) / 175$ Perennial Stream $1 - (\text{Distance} - 50) / 250$	Intermittent Stream <25 feet Perennial Stream < 50 feet ----- 1.0
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