Preliminary Monitoring Results – Annual Flow, Precip., TSS and Phosphorus: WY 2004

Project Overview – Continuous Monitoring Program

Five USGS continuous monitoring stations within the 1,580 sq. km Lower Fox Basin have been installed directly through the project. These stations will provide 5 years of data beginning in October 2003 and ending September 30, 2008:

- Duck Creek at CTI FF (276 km²) – upgraded with sampler (co-sponsored by Oneida Tribe)
- Baird Creek at Superior Road (~35 km²)
- Apple Creek at CTH FF (~48 km²)
- East River at Monroe St. (~74 km²) – (co-sponsored by GBMSD)

USGS has computed daily total phosphorus (TP) and total suspended solids (TSS) loads for each stream, and will estimate the dissolved phosphorus (DP) loads. TSS concentrations have also been correlated with turbidity data from UW-AFRE.

Average annual total suspended solids and phosphorus yields from LFRWMP watersheds in 2004:

- LFRWMP Apple, Ash, and Baird clay soils watersheds fairly similar in 2004. TSS yields (~0.75 ton/ha) and phosphorus yields (~2.0 kg/ha) under 1989-2000 climatic period from similar areas (Baumgart 2005 modeling report for Oneida Nation).
- 2004 yields from clay soil watersheds similar to 1991-94 average annual yields from Bower Creek (35 sq. km), but much lower than in 1993 (no samples collected during the largest two runoff events in 1993, so only estimated).
- 2004 measured yields nearly twice as high as SWAT modeled TSS yield of 0.45 t/ha and P yield of 1.0 kg/ha under 1989-2000 climatic period from similar areas (Baumgart 2005 modeling report for Oneida Nation).
- 2004 yields from clay soil watersheds similar to 1991-94 average annual yields from Bower Creek (35 sq. km), but much lower than in 1993 (no samples collected during the largest two runoff events in 1993, so only estimated).
- Very large runoff events captured in fall (Nov. 23-25), spring snowmelt period (March 1-4), and May 23-24.

Preliminary Results

- Second wettest May on record (211 mm) was 3x normal, and responsible for excessive runoff and loads in May and early June.
- Annual precipitation (813 mm) was only 10% above normal (741 mm).
- Annual stream flow ranged from 33 to 43% of total precipitation.
- Apple, Ash., Baird similar median total suspended solids (TSS) conc. (~126 mg/L) – ~2.5x previous studies.
- Maximum TSS: from 960 mg/L at Duck to 2,700 mg/L at Baird.
- High total phosphorus (TP), dissolved phosphorus (DP) in all streams.
- TP median concentration 0.28 – 0.70 mg/L. 25% of Ash. Creek samples > 0.93 mg/L. TP max. concentrations > 2 mg/L at all sites.
- Annual median DP to TP fractions ranged from 49-57%.
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- Apple and Ashwaubenon Creek respond similarly on a seasonal basis, as do Baird and Duck Creek which have a greater proportion of wetlands.

Annual summary of flow, precip, TSS & total phosphorus:

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- Maximum TSS: from 960 mg/L at Duck to 2,700 mg/L at Baird.
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- Late November heavy rain, freeze, and winter precip. contributed to March flows.
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