**Estimation of P load from JBW in tile discharge**

Assumptions

1. Total annual TP and TDP loads from each of the monitored tile lines over the monitoring period normalized to areal loads (kg/ha) based on field area (assuming = tile drainage area)

2. Descriptive statistics on areal P loads from group of monitored fields JBT01 – JBT19

3. This data appears to be ~normally distribution, so use actual data.

4. Select median areal TP and TDP loads and 95% CI to provide representative areal P loads to use in whole JBW estimate

5. Use VTAAFM data on entire JBW with fields clipped to watershed boundaries, “Presence of tile” from inventories by crop type, soil P, and manure (all in agreement)

Two approaches:

1. Apply median/95% CI values for annual TP and TDP areal export from all monitored fields to sum of all tiled ag land in JBW

2. Because analysis revealed significant difference in P load from row crop (corn, soybean) vs. hay (hay, alfalfa), apply P areal export data from row crop (RC) land area and hay land (H) separately and sum for JBW.

**Approach 1**

All data combined

|  |  |  |
| --- | --- | --- |
|  | **Areal TPx (kg/ha/yr)** | **Areal TDPx (kg/ha/yr)** |
| Range | 0.122 – 1.124 | 0.083 – 0.556 |
| Median | 0.541 | 0.199 |
| Mean | 0.555 | 0.272 |
| 95% C.I. | 0.368 – 0.743 | 0.166 – 0.378 |

Total JBW tiled area = 2089.2 ac = 845.5 ha

Estimated annual P load from tiled ag land in JBW:

TP: 457.7 kg/yr 311.1 – 638.2 kg/yr

TDP: 168.2 kg/yr 140.4 – 319.6 kg/yr

**Approach 2**

Row crop (RC) and hay (H) estimated separately

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **RC** | | **H** | |
| **Areal TPx (kg/ha/yr)** | **Areal TDPx (kg/ha/yr)** | **Areal TPx (kg/ha/yr)** | **Areal TDPx (kg/ha/yr)** |
| Range | 0.276 – 1.124 | 0.153 – 0.556 | 0.122 – 0.451 | 0.083 – 0.212 |
| Median | 0.650 | 0.289 | 0.249 | 0.101 |
| Mean | 0.649 | 0.318 | 0.274 | 0.132 |
| 95% C.I. | 0.441 – 0.857 | 0.191 – 0.445 | 0.138 – 0.686 | 0.042 – 0.306 |

JBW tiled area (assuming 50-50 split of corn/hay rotation)

RC = 1517.2 ac = 614 ha

H = 572 ac = 231.5 ha

Estimated annual P load from tiled ag land in JBW when row crop and hayland separated:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **TP (kg/yr)** | | **TDP (kg/yr)** | |
| **RC** | 399.1 | 270.8 – 526.2 | 177.4 | 117.3 – 273.2 |
| **H** | 57.6 | 32.0 – 158.8 | 23.4 | 9.7 – 70.8 |
| **TOTAL** | 456.7 | 302.8 – 685.0 | 200.8 | 127.0 – 344.0 |

**TP**

**TDP**

