



Delivery Factors and Compliance Issues in Falls Lake Nutrient Accounting

March 28, 2018 – UNRBA Path Forward Committee

Department of Environmental Quality



Today's Topics

- Delivery factors and scenarios
- How this relates to Falls Stage 1 and 2
- Stage 1 compliance requirements related to delivery factors

Issues for You to Consider Today

1. Whether to have delivery factors?
 - If yes - they would apply to New Dev buydowns, DMS/bank projects, Existing Dev retrofits, jurisdictional loads
2. Whether to restrict location of Existing Dev projects?
 - If yes - projects could be in other Delivery Zones in same jurisdiction, or outside jurisdiction as part of Joint Compliance agreement

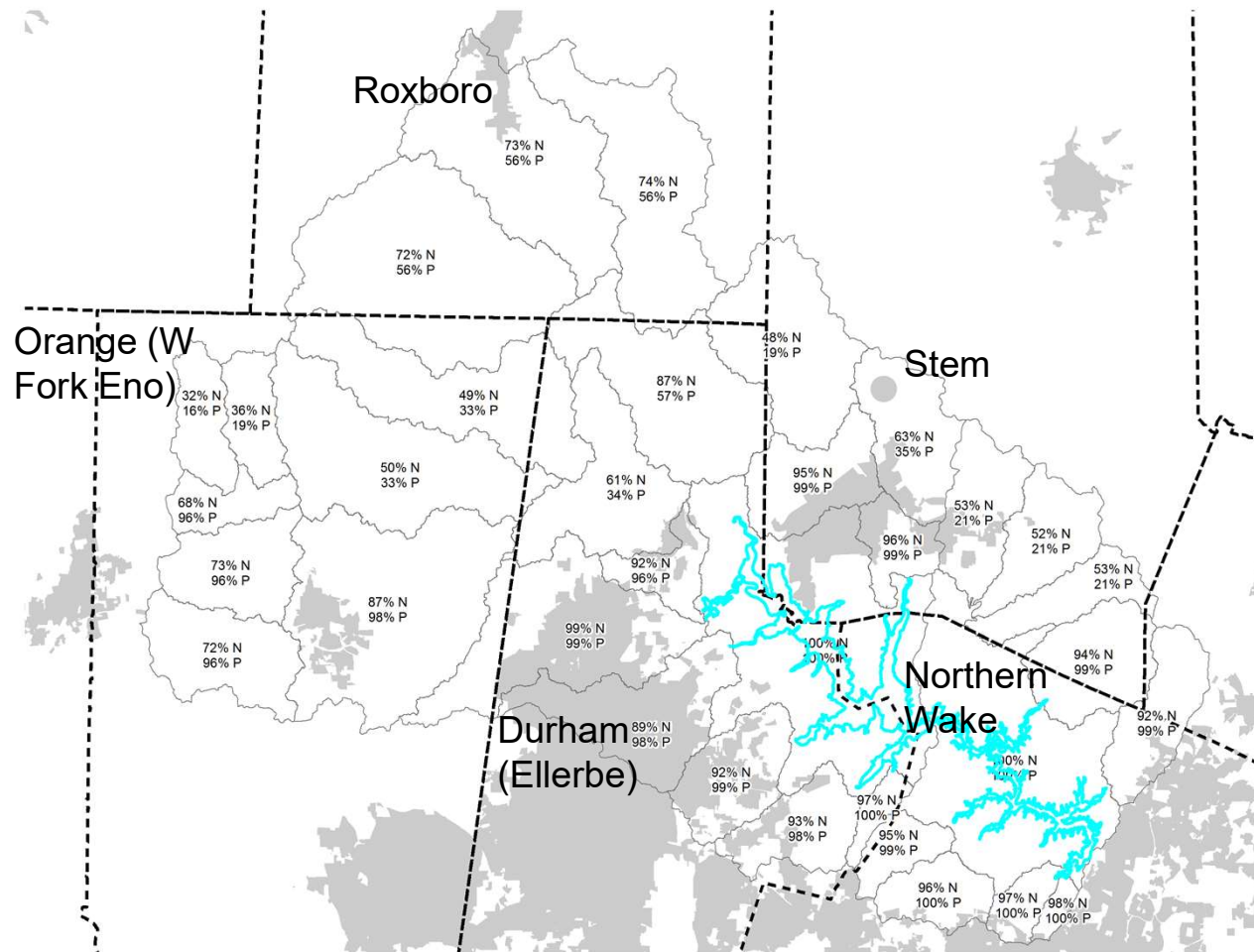
Delivery Factors Background

- What are Delivery Factors?
 - Values used to account for the fractional in-stream loss of nutrients through various biogeochemical processes between the nutrient source and the destination waterbody.
- Delivery factors provide a common currency (delivered pounds) for nutrient debits and credits generated anywhere in the watershed
- They enable trading between entities and nutrient-generating sectors

Delivery Factors Terms

- Delivery factors/transport factors → the percentage leaving the source that reaches the destination waterbody.
- Trapping factors → the percentage leaving the source that is retained and does not reach the destination waterbody.
- Delivery zones → grouping of small watersheds by their delivery/trapping factors in a watershed model.

Delivery Factor Scenarios Map – Example Locations



Example Stage 1 Loads

| Location | Delivery Factors (N , P) | At-source Load / Reduction (N , P lb/yr) * | Delivered Load (N , P lb/yr) |
|-------------------------------------|-------------------------------------|---|---|
| Durham (Ellerbe) | 89% , 98% | 100 , 10 | 89 , 9.8 |
| NW Orange County (W Fork Eno) | 32% , 16% | 20 , 2 | 64 , 0.32 |
| Roxboro | 73% , 56% | 10 , 1 | 7.3 , 0.56 |
| Northern Wake | 100% , 100% | 50 , 5 | 50 , 5 |
| Stem | 63% , 35% | 10 , 1 | 6.3 , 0.35 |

* At-source load/reduction is a guess for demonstration purposes only



Example New Development Buydown

| Location | Delivery Factors (N , P) | At-source Load / Reduction (N , P lb/yr) * | Delivered Load (N , P lb/yr) |
|----------------------------------|-------------------------------------|---|---|
| Durham (Ellerbe) | 89% , 98% | 4 , 0.4 | 3.56 , 0.39 |
| NW Orange County (W Fork Eno) | 32% , 16% | 4 , 0.4 | 1.28 , 0.06 |
| Roxboro | 73% , 56% | 4 , 0.4 | 2.92 , 0.22 |
| Northern Wake | 100% , 100% | 4 , 0.4 | 4 , 0.4 |
| Stem | 63% , 35% | 4 , 0.4 | 2.52 , 0.14 |

* At-source load/reduction is a guess for demonstration purposes only

Example DMS project (1 acre)

| Location | Delivery Factors (N , P) | At-source Load / Reduction (N , P lb/yr) * | Delivered Load (N , P lb/yr) |
|----------------------------------|-------------------------------------|---|---|
| Durham (Ellerbe) | 89% , 98% | -75.76 , -4.88 | -67.43 , -4.78 |
| NW Orange County (W Fork Eno) | 32% , 16% | -75.76 , -4.88 | -24.24 , -0.78 |
| Roxboro | 73% , 56% | -75.76 , -4.88 | -55.30 , -2.73 |
| Northern Wake | 100% , 100% | -75.76 , -4.88 | -75.76 , -4.88 |
| Stem | 63% , 35% | -75.76 , -4.88 | -47.73 , -1.71 |

* At-source load/reduction is a guess for demonstration purposes only

Example Existing Development SCM Retrofit

| Location | Delivery Factors (N , P) | At-source Load / Reduction (N , P lb/yr) * | Delivered Load (N , P lb/yr) |
|-------------------------------------|-------------------------------------|---|---|
| Durham (Ellerbe) | 89% , 98% | -15 , -2 | -13.35 , -1.96 |
| NW Orange County (W Fork Eno) | 32% , 16% | -15 , -2 | -4.8 , -0.32 |
| Roxboro | 73% , 56% | -15 , -2 | -10.95 , -1.12 |
| Northern Wake | 100% , 100% | -15 , -2 | -15 , -2 |
| Stem | 63% , 35% | -15 , -2 | -9.45 , -0.7 |

* At-source load/reduction is a guess for demonstration purposes only

Delivery Factor Summary

- Delivery zone position can make a big difference in the delivered load or delivered reduction
- Delivered load matters when you want to obtain credits originating in a different delivery zone
- Delivery zones steer credit projects closer to the lake, development has lower reduction needs further from the lake
- Delivery zones improve our estimate of impact of development and restoration on the lake
- Delivery factors don't change the at-source % reduction need

Falls NMS – Stage 1

- Load amount is the increase in annual loading from new development after baseline, but before New D ordinances
- Reduction requirements not related to the lake model

Falls NMS –Stage 2 Loads

- Loads for development existing at baseline
- 40% N and 77% P reductions apply to Stage 2 loads and New Development loads
- Reduction requirements derived from lake model's estimated baseline conditions
- UNRBA's watershed modeling efforts may be a source for setting Stage 2 jurisdictional loads

Existing Development Direct Compliance

- Problem: Who gets credits from projects?
 - Who implements / who pays / who owns property
- Proposed approach:
 - Credit goes to “implementer” or
 - Funds can come from LGs, state/Fed grants
 - Property owner cedes credit to implementer

Existing Development Direct Compliance

- Where can projects be implemented?
 - How to ensure fair access to opportunities between entities with different resources?
- Proposed approach:
 - Limit implementation of existing D projects outside jurisdiction for direct compliance
 - Use to prevent good projects in your jurisdiction getting acquired by another LG before you have resources
 - Would not apply to DMS/banks or trading
 - Would not apply for joint compliance (multi-jurisdictional or ED – WW)

Joint Compliance – Trading Framework

- Group compliance between local governments
- Jurisdictional compliance (wastewater and stormwater)
- Offset credits from banks, DMS
- Mixed group/jurisdictional compliance “bubble”

Discussion

- Use Delivery Factors? Y/N
- Limit locations of Existing D retrofits? Y/N

QUESTIONS?



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