Loading Reduction Goals

Ellie Rauh and Rich Gannon

NC DWR

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Modeled Reductions to Meet Chl-a Standard

- Overall, new model is calling for significant additional nutrient loading reductions to meet chl-a standard.

Current Rule – Lake Reduction Goals*		
	N	P
Upper NH	35%	5%
Lower NH	0%	0%
Haw	8%	5%

* relative to 1997-2001 baseline period

New Lake Model – Further Lake Reduction Needs*		
	N	P
Upper NH	**60-70%**	0-50%
Middle NH	**30-60%**	**0-70%**
Haw	**0-70%**	**0-40%**

* relative to 2014-2016 model period

- Model is available for external review.

Station Set: Haw Stations

P loading reduction (%)	Nitrogen Loading Reduction (%)							
	0%	10%	20%	30%	40%	50%	60%	70%
0%	0.21	0.20	0.18	0.17	0.16	0.16	0.17	0.10
10%	0.19	0.18	0.16	0.15	0.14	0.14	0.15	0.10
20%	0.16	0.15	0.14	0.13	0.12	0.12	0.12	0.09
30%	0.13	0.12	0.11	0.09	0.08	0.09	0.09	0.07
40%	0.10	0.10	0.08	0.07	0.06	0.05	0.05	0.05
50%	0.09	0.08	0.07	0.06	0.05	0.03	0.03	0.03
60%	0.08	0.08	0.06	0.05	0.04	0.03	0.02	0.02
70%	0.07	0.07	0.05	0.04	0.03	0.02	0.01	0.01

Possible:

- **30% N and 30% P**
- **20% N and 30% P**

> Studies outside the model show that its better to have a balance between N and P management for algal dynamics and impacts on both freshwater and marine systems.

Any new reduction goal will have a new baseline of 2014-2016.

Station Set: Morgan & Upper New Hope

Nitrogen Loading Reduction (%)

P loading reduction (%)	0%	10%	20%	30%	40%	50%	60%	70%
0%	0.29	0.28	0.26	0.25	0.22	0.17	0.11	0.05
10%	0.29	0.27	0.26	0.24	0.22	0.16	0.11	0.05
20%	0.28	0.26	0.25	0.24	0.21	0.16	0.11	0.05
30%	0.27	0.25	0.24	0.23	0.21	0.16	0.11	0.05
40%	0.26	0.24	0.24	0.22	0.20	0.16	0.11	0.05
50%	0.24	0.23	0.23	0.21	0.19	0.15	0.10	0.05
60%	0.23	0.22	0.21	0.20	0.18	0.14	0.10	0.05
70%	0.22	0.21	0.20	0.19	0.17	0.13	0.09	0.05

Color Scale

0.10	0.13	0.16	0.19	0.22	0.25	0.28	0.31	0.40

Station Set: Middle New Hope

Nitrogen Loading Reduction (%)

P loading reduction (%)	0%	10%	20%	30%	40%	50%	60%	70%
0%	0.25	0.23	0.21	0.18	0.13	0.11	0.09	0.06
10%	0.24	0.22	0.20	0.17	0.13	0.10	0.08	0.06
20%	0.23	0.21	0.19	0.17	0.12	0.10	0.08	0.05
30%	0.22	0.20	0.19	0.16	0.12	0.09	0.07	0.05
40%	0.21	0.19	0.18	0.15	0.11	0.09	0.07	0.04
50%	0.19	0.18	0.16	0.14	0.10	0.08	0.06	0.04
60%	0.17	0.16	0.14	0.12	0.08	0.06	0.05	0.03
70%	0.15	0.14	0.12	0.10	0.07	0.05	0.03	0.02

Color Scale

0.10	0.13	0.16	0.19	0.22	0.25	0.28	0.31	0.40

Station Set: Morgan & Upper New Hope

P loading reduction (%) \ Nitrogen Loading Reduction (%)	0%	10%	20%	30%	40%	50%	60%	70%
0%	0.29	0.28	0.26	0.25	0.22	0.17	0.11	0.05
10%	0.29	0.27	0.26	0.24	0.22	0.16	0.11	0.05
20%	0.28	0.26	0.25	0.24	0.21	0.16	0.11	0.05
30%	0.27	0.25	0.24	0.23	0.21	0.16	0.11	0.05
40%	0.26	0.24	0.24	0.22	0.20	0.16	0.11	0.05
50%	0.24	0.23	0.23	0.21	0.19	0.15	0.10	0.05
60%	0.23	0.22	0.21	0.20	0.18	0.14	0.10	0.05
70%	0.22	0.21	0.20	0.19	0.17	0.13	0.09	0.05

Station Set: Middle New Hope

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10%	0.24	0.22	0.20	0.17	0.13	0.10	0.08	0.06
20%	0.23	0.21	0.19	0.17	0.12	0.10	0.08	0.05
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Color Scale

0.10	0.13	0.16	0.19	0.22	0.25	0.28	0.31	0.40

Combined Upper and Lower New Hope Possible:

- 50% N and 50% P

(upper – 60% N and 50% P;
lower – 40%N and 50% P)

- Simplified implementation admin for Wake, Chatham, Cary

Any new reduction goal will have a new baseline of 2014-2016.

New Rules Design and Load Reduction Metrics

2024 Lake Model -> 202X Rules % N, P load reduction goals

- Lake % reduction goals = overall targets; all sectors to meet collectively beyond draft rules horizon.
- DWR not proposing to apply % goals as specific load reduction requirements for all sectors. For nonpoint sources, propose largely moving away from lbs N and P as compliance metrics.

1. Questions and Comments.

- Q&A for the whole group.

2. Table Discussion.

- Talk about your top concerns and questions about these general load reduction proposals.
- Contribute any comments on the benefits of these changes or any new idea you would like considered.
- Write down your comments on the papers provided – same for online groups.

Next slides are back up for Q&A

New Rules Design and Load Reduction Metrics

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Wastewater: Retaining annual mass load assignments in NPDES permits. Any offsets require quantification of annual mass load reductions.

New Development Stormwater: Plan tiered % BUA triggers with commensurate onsite practices to minimize hydrologic impacts and achieve nutrient neutrality. Offsets may be unnecessary - this would impact banking sector. Likely proposing continued use of lb/ac/yr loading calculations to track changes from development over time. Rule could include optional loading rate target approach.

Existing Development Stormwater: Plan investment-based compliance as main approach, which would allow both those practices with lb/yr reductions accounting and those with known but currently unscripted nutrient benefits.

Agriculture: Plan to set aside collective N loss compliance accounting via NLEW. In place, would track array of specific activities with various units of implementation. Considering direct regulation of certain activities, which would also involve tracking units of implementation.

Connection of Goals to Current Rules Design

- 2003 Lake Model -> 2009 Rule % N, P reduction goals
- Lake % reduction goals were translated to:
  - WWTP annual mass N, P load allocations w/in 1 to 9 years
  - Agriculture - Subwatershed % N loss reduction goals for collective compliance w/in 6 to 9 years, tracked using NLEW, and subwatershed P activity units tracking
  - New Development (barred) – projects meet subwatershed N, P loading rate targets (lb/ac/yr) embodying goals via combination of onsite and offsets
  - Existing Development (barred) - Stage 2 local government and state/federal annual mass load reduction assignments, implementation toward goals to begin at 6 to 9 years

Last Meeting Goal Workshop Comments

- Last Meeting Workshop General Comments on the 3 ideas (combing upper and lower, staged goals, sector specific goals):

- Almost all were in favor or combining upper and lower new hope sub-watersheds.

- Surprising to DWR, there was not strong support for staged goal setting. Some comments that we should not stage the model goals and not delay implementation. Other comments that need staged goals, but also the long-term goals are set at the same time. There was more interest in how the reduction goals applied to the specific sectors/rules.

- Mixed comments on the need for sector specific goals – some wanting to see the same goals for all sectors and some wanting to see sector specific goals and targets.

Nutrient Rules - Impacts on Watershed

- Rules aiming to limit nutrients reaching Jordan Lake can have co-benefits for the watershed.
  - **Reduce nutrient and other pollutant loading** and **flow-related impacts** to local streams, rivers, and groundwater.
  - Improve overall **aquatic habitats.**
  - **Social and Economic benefits** from investing in resilient infrastructure and/or public outreach.
    - “Green infrastructure” practices reconnect people to streams, other waters, reduce heat effects, sequester carbon, improve quality of life.