Jordan Lake Targeted Watershed Project: Incorporating Urban Stormwater into an Incentive-Based Watershed Permitting Framework

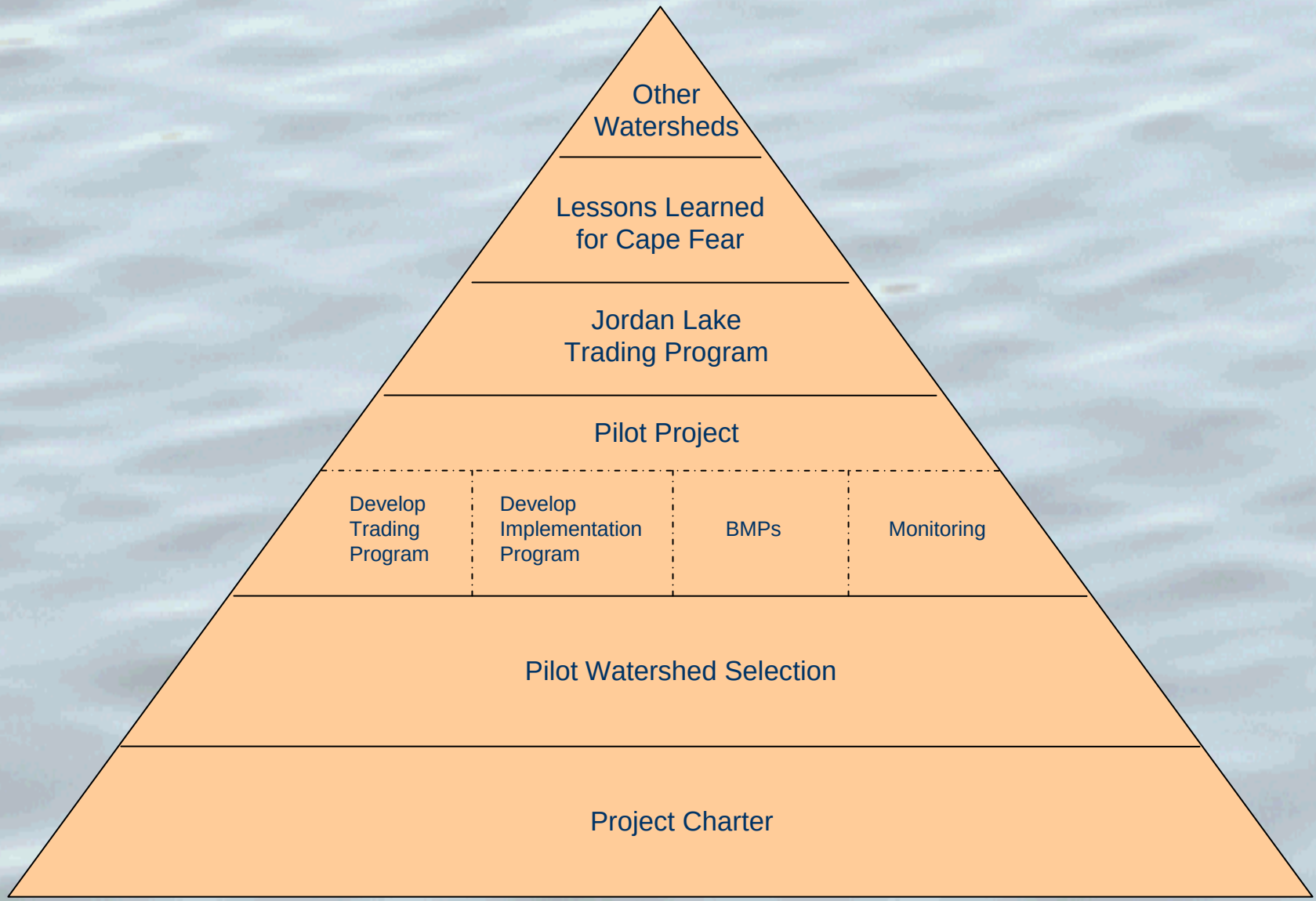
Stakeholders Meeting

November 29, 2006

Today's Agenda

- Introductions
- EPA Remarks
- Pilot Subwatershed Trades
  - Last Meeting Discussion
  - Revised Approach
  - Trading Examples
  - Discussion
- Path Forward

Project Structure



Prior Meeting Discussion

- CH2M HILL presented trading tool framework which uses existing watershed model as basis
- Concerns raised regarding the model
  - Land use – inconsistent land use between model and draft Jordan rules
  - DWQ stakeholder process
- Trading between jurisdictions
  - Watershed model is based on HUC

Selection of Trading Examples

- Project Goals
  - Improve and protect water quality in the Jordan Lake watershed
  - Include all point and nonpoint sources in the trading and watershed permitting framework
  - Demonstrate utility of trading
- Select examples which include variety of sources and regulatory requirements
- BMP areas identified in pilot subwatersheds – can be more specific with costs
- Evaluate trading in Upper New Hope and other Jordan Lake subwatersheds

Today's Objectives

- Obtain feedback from stakeholders on proposed approach
- Obtain input from stakeholders on types of examples to evaluate
  - Base on project goals/charter

Revised Approach

- Develop specific trading examples

Development of Trading Examples

- Hypothetical
- Demonstrate approach

Potential Trading Partners

Buyer	Seller
Point Source	Point Source
Point Source	Agriculture
Stormwater	Point Source
Stormwater	Point Source/Agriculture
Point Source	Point Source/Agriculture
Stormwater	Agriculture
NCDOT	NCDOT
Stormwater	Stormwater

Trade Development

- Select Subwatershed
- Identify Municipalities, Point Sources, and other Sources
- Identify and Quantify Credit Needs
- Identify Quantify Credit Sources

Trade Elements

- Credit Quantification
- Credit Certification and Verification
- Uncertainty Addressed
- Trading Mechanisms
- Credit Life/Credit Banking
- Trade Duration
- Risk Management
- Permitting Frameworks

Example 1: Municipal STW (Existing Development) Purchases Credits From New Development

- New Development (Seller)
  - 50 acres with 6 houses per acre
- Existing Development (Buyer)
  - Purchase “excess” treatment

Example 1: Municipal STW (Existing Development) Purchases Credits From New Development

- Assume:
  - equal # of houses regardless of BMP scenario
  - no loss or gain of land value
  - must meet Jordan Lake TMDL rules before trading (4 lb-N/ac-yr)
- Five Scenarios of BMPs used

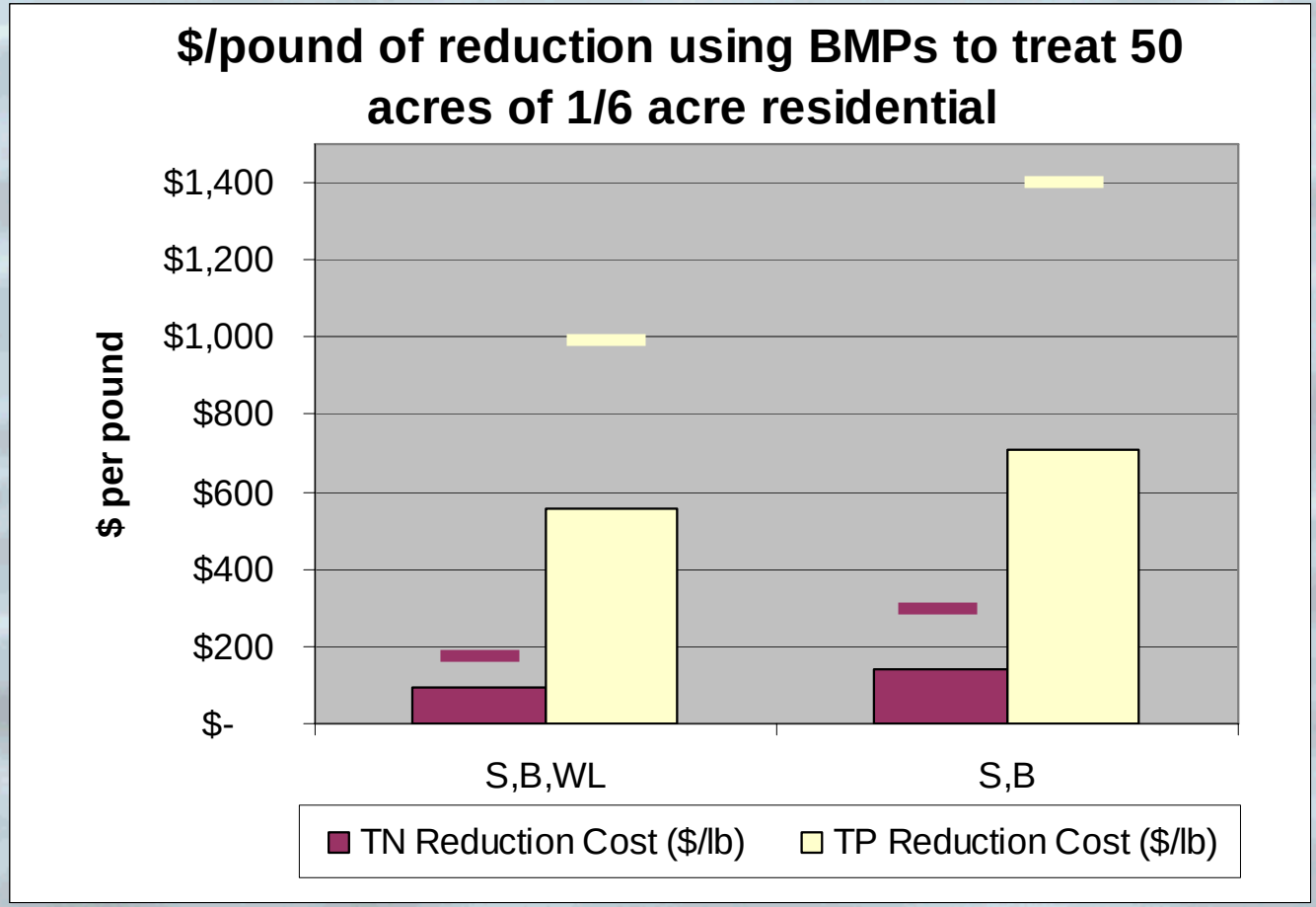
#	BMPs	TN export lb/ac-yr	TP export lb/ac-yr
1	No BMPs	8.22	1.32
2	Wet detention (WD)	6.17	0.79
3	Stormwater wetland (WL)	4.93	0.86
4	Swale and bioretention (S,B)	3.74	0.43
5	Swale and wet detention (S,WD)	4.32	0.47
6	Swale, bioretention, wetland (S,B,WL)	2.24	0.28

Example 1: Municipal STW (Existing Development) Purchases Credits From New Development

	Load produced	Load produced	Credits buy or (sell)	Credits buy or (sell)
Scenario	TN (lbs/yr)	TP (lbs/yr)	TN (lbs/yr)	TP (lbs/yr)
1 (none)	411	65.9	221/301	(5.6)/25
2 (WD)	308	39.5	118/198	(32)/(1.5)
3 (WL)	247	42.8	57/137	(29)/1.8
4 (S,B)	187	21.7	(3)/77	(50)/(19)
5 (S, WD)	216	23.7	26/106	(57)/(17)
6 (S,B,WL)	112	14.2	(78)/2	(66)/(27)

Haw Watershed to left of slash; UNH to right of slash

Example 1: Municipal STW (Existing Development) Purchases Credits From New Development



Costs include design, construction, 20 yrs of maintenance.

Example 2: Municipal STW Program Buys Credits from Agriculture

- Haw River watershed – Alamance County
- Agriculture (Credit Seller)
  - 100 acres of cropland in northern Alamance
  - Assume agriculture has met its Jordan Lake reduction targets
  - Any reduction is a credit which can be sold
- Burlington Stormwater Program (Buyer)
  - Take cropland out of production

Example 2: Municipal STW Program Buys Credits from Agriculture

- Current loading on 100 acres is:
  - TN: 1227 lb/yr
  - TP: 200 lb/yr
- Future loading (forest) is:
  - TN: 45 lb/yr
  - TP: 10 lb/yr
- Credits
  - TN: 1182 lb/yr
  - TP: 190 lb/yr

Example 2: Municipal STW Program Buys Credits from Agriculture

- 100 acres of farmland in Alamance County valued at $265,000
- Assuming:
  - No additional payment for lost production
  - No additional cost for tree planting
  - No additional cost for forest maintenance
- Cost per pound reduction:
  - $224 /lb TN
  - $1395 /lb TP
- One time cost

Example 2: Municipal STW Program Buys Credits from Agriculture

- 50 acres new development; 6 houses per acre.
- Assume:
  - equal # of houses regardless of BMP scenario
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5	Swale and wet detention (S,WD)	4.32	0.47
6	Swale, bioretention, wetland (S,B,WL)	2.24	0.28

Example 3: Municipal STW Program Buys Credits From Point Source

- Upper New Hope Creek Subwatershed
- OWASA Mason Farm WWTP (Seller)
- Town of Chapel Hill STW Program (Buyer)

Example 3: Municipal STW Program Buys Credits From Point Source

Avoid retrofit of existing 500 acre residential development

35% reduction in nitrogen load
5% reduction in phosphorus load

Existing loadings

Nitrogen	8.22 lbs/ac/yr,	4,110 lbs/yr
Phosphorus	1.32 lbs/ac/yr,	660 lbs/yr

Required reductions

Nitrogen	1,439 lbs/yr
Phosphorus	33 lbs/yr

Example 3: Municipal STW Program Buys Credits From Point Source

Delivery Factors

Nitrogen	0.63
Phosphorus	0.47

Required reductions

Nitrogen	1,439 lbs/yr
Phosphorus	33 lbs/yr

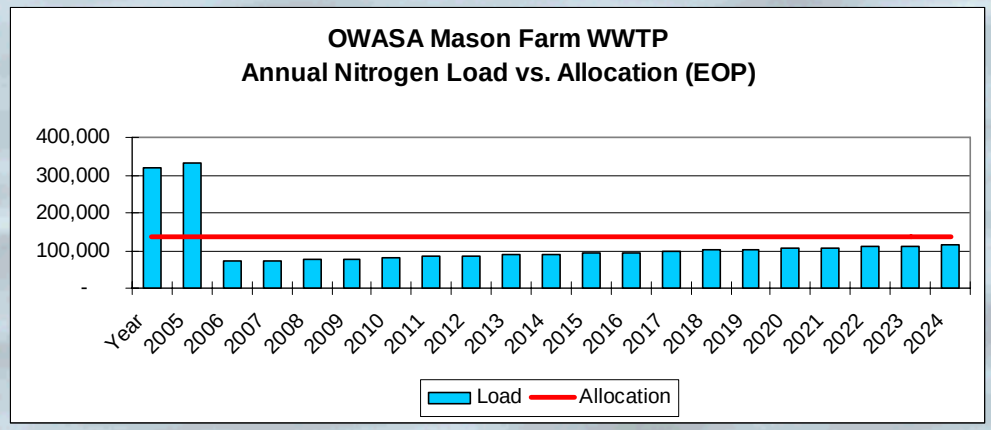
Credits Needed

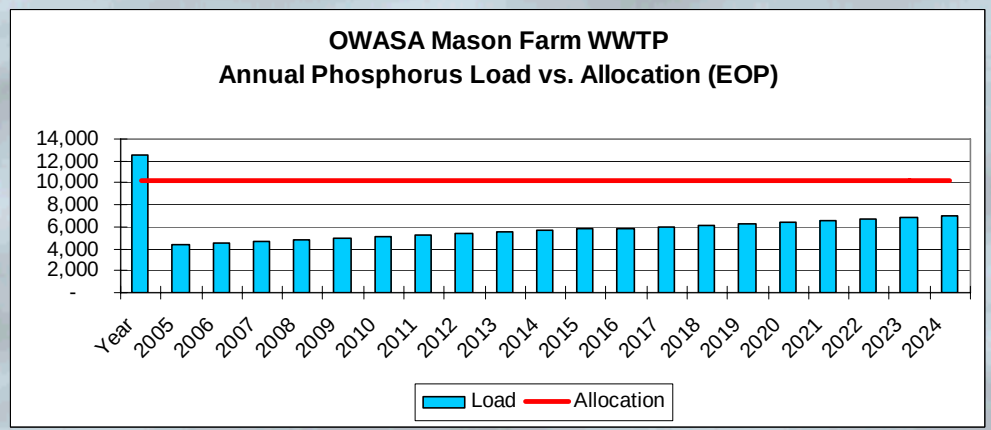
Nitrogen	993 lbs/yr
Phosphorus	416 lbs/yr

Example 3: Municipal STW Program Buys Credits From Point Source

Credit availability – OWASA's Mason Farm WWTP

$50 M upgrade currently in progress





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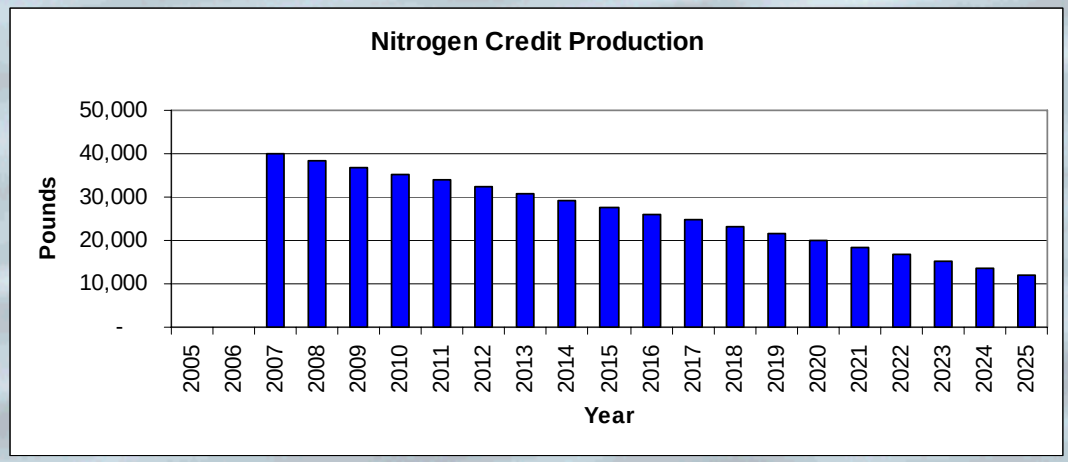

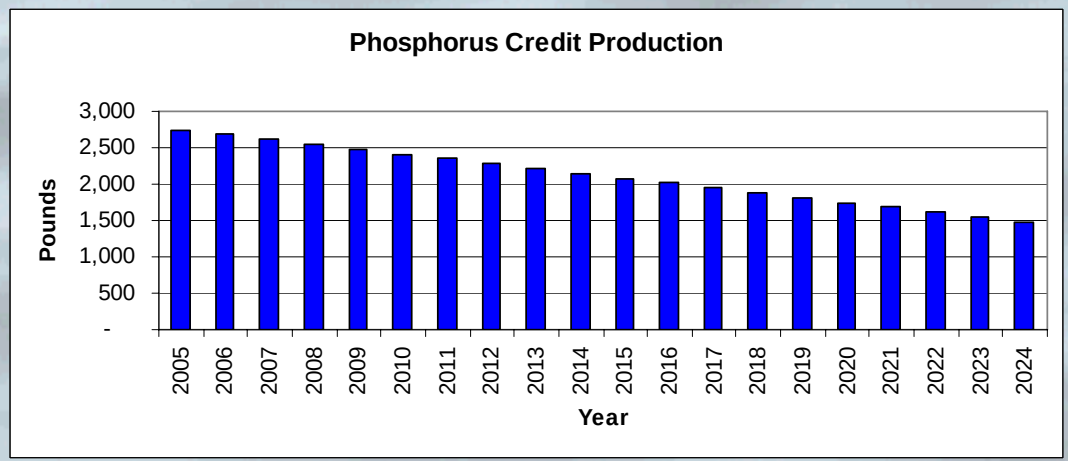

Example 3: Municipal STW Program Buys Credits From Point Source

- OWASA has credit glut
- OWASA can meet Chapel Hill's credit need and have credits available for other buyers
- South Durham WRF?

Discussion Objectives

- Obtain feedback from stakeholders on proposed approach
- Obtain input from stakeholders on types of examples to evaluate
  - Base on project goals/charter
- Obtain input from stakeholders on priority of examples

Next Steps

- Select trading examples
- Work with pilot area local governments and DWQ to develop trading examples
  - Costs
  - BMPs
  - Trading ratios
  - Point source upgrades
- Evaluate implementation options
- Other

Next Steps

- Monitoring – draft TM with placeholders for pilot area BMP monitoring
- Meetings
  - January 31, 2007
  - June 20, 2007