Nutrient Assimilation Credits:
Opportunities to Expand Trading beyond Source Reductions?

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Recap: Nutrient Trading in the Bay

Provide regulated point sources compliance options for meeting stringent load caps.

Recap: Point Source Caps

Bay states have asked these sources for a greater than proportional share of overall nutrient reduction goals in the Bay.

Recap: Point Source Caps, cont.

- Mass load caps based on stringent controls for existing sources & no new WLA for new sources.

- Ex. VA Potomac/Shenandoah point source cap represents 57% reduction from 1985 baseline.

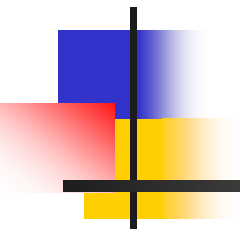
Recap:
Point Source Trading Opportunities

- Focused primarily securing offsets with agricultural nonpoint sources (financing BMPs)

Two Policy Premises

1) Provide point sources maximum flexibility on meeting stringent and costly caps in face of growth

2) Provide the public with assurances that offsetting reductions occur.



Enhancing Flexibility

Nutrient Assimilation Services

Source load reductions (PS and NPS) are only *one* means to meeting water quality goals in the Chesapeake Bay

Enhancing the assimilative capacity of the ecosystem to remove nutrients from Bay system is another.

Nutrient Assimilation Credits

Documented N & P removal from ambient waters through investments to enhance nutrient assimilation services can be called ***nutrient assimilation credits***

Nutrient Assimilation Credits

Why not allow point sources to enhance/expand these widely acknowledged water quality enhancing services to help point sources meet their cap?

Examples

1. Expanding Oyster Aquaculture
2. Algal Biomass Harvest
3. Wetland Restoration

Illustration: Nutrient Assimilation Credits from Oyster Aquaculture

“It is the oyster's eating habits that make it so important to its environment: it is a voracious filter feeder that performs several vital functions in the Bay's ecosystem”

Example: Nutrient Assimilation Credits from Oyster Aquaculture

While wild restoration has been difficult, oyster aquaculture can successfully grow native Chesapeake Bay oysters. Expansion, however, is limited by finances.

N and P removal from:

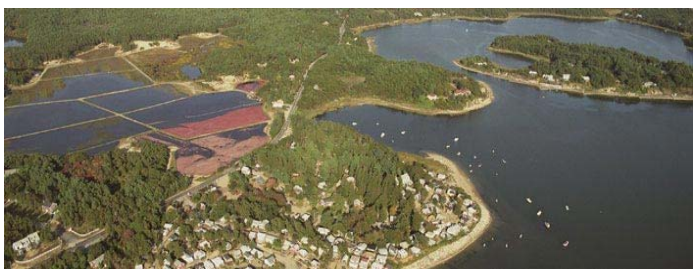
- Oyster harvest (biomass harvest)
- Nutrient conversion of oyster biodeposits (nitrification & denitrifcation)

Example: Nutrient Assimilation Credits from Oyster Aquaculture

2006 Chesapeake Bay Targeted Watershed Grant Project: “Nutrient Assimilation Credits: Opportunities for Enhanced Oyster Production”
http://oyster.agecon.vt.edu/

Improving Marine Water Quality by Mussel Farming: A Profitable Solution for Swedish Society

Nutrient removal credits from mussel aquaculture in Sweden



Nutrient removal projects from oyster aquaculture in Buzzards Bay MA, and ribbed mussels in NY, NY

Illustration: Nutrient Assimilation Credits from Algal Harvest

Algal harvest facilities rapidly grow algae in order to remove nutrients from ambient water or from treated effluent discharge.

Nutrients removed when algae is harvested

Example: Nutrient Assimilation Credits from Algal Harvest

http://www.algalturfscrubber.com/

Algal Turf Scrubber (left)

Nutrient Removal Rates: Annual nitrogen removal rates 6,700 lbs/per treatment acre in FL.

N and P removal rates can be directly quantified with high levels of certainty

Projects underway in FL & NY

Illustration: Nutrient Assimilation Credits from Wetland Restoration

"Forested riparian (or streamside) wetlands remove about 80 percent of the phosphorus and 90 percent of the nitrogen from water, which act as water contaminants and may result in unhealthy algae blooms."

Example: Nutrient Assimilation Credits from Wetland Restoration

THE WETLANDS INITIATIVE

Invested in 1,300 acre wetland restoration project to demonstrate nutrient removal in IL.

WI claims restored wetlands can remove 275 pounds of TN/ac/yr at cost of about $1/lb.

http://www.wetlands-initiative.org/NutrientFarming.html

Comparison with Ag NPS

Activities necessary to offset nitrogen discharge from 1 mgd WWTP expansion

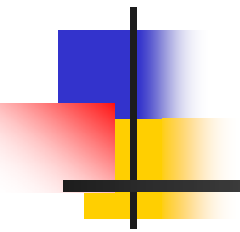
Cornland BMPs above baseline	nearly 4,500 acres
Oyster Aquaculture	3 to 25 million oysters (10 to 80 acres)
Algal Turf Scrubber	2 to 10 acres
Restored Floodplain Wetland	66 acres

Will nutrient assimilation credits work?

I don’t know...

but neither does anyone else, and other offset alternatives look tough!

We need a system that creates incentives to search, develop, and try new nutrient removal options.



Public Assurances

Possible Advantages of Nutrient Assimilation Credits

- Public assurances that offsets occur
  - In some cases, greater certainty in quantifying, tracking, & verifying load reductions
  - May avoid some difficult baseline issues encountered with NPS credits

Public Assurances, Ag BMPs

Verifying behavior and practice change

Crop uptake

Edge of Field

Infiltration

Edge of Stream

Attenuation

Public Assurances: Nutrient Assimilation Credits

Direct measurement sometimes possible (e.g. N & P in biomass harvest, inlet/outlet)

Verification of offset activity maybe more straightforward

Frequently fewer complex chemical and biological processes to estimate (fate and transport)

Fewer offset projects to verify

Possible Advantages of Nutrient Assimilation Credits

- Public assurances that offsets occur
  - In some cases, greater certainty in quantifying, tracking, & verifying load reductions
  - May avoid some difficult baseline issues encountered with NPS credits
- Possible spillover benefits
- Cost between offset options?

Challenges for Nutrient Assimilation Credits

- Legal issues/uncertainties arising from the Clean Water Act (are these approaches instream treatment and is this IST applicable in this situation?)
- Program orientation around practices rather than performance.
- Additionality
- Others?

Question for the group...

How to include nutrient assimilation credits as an *option* for point sources under nutrient trading guidelines?