Suggestions for implementing
the

EXECUTIVE ORDER

CHESAPEAKE BAY PROTECTION AND RESTORATION

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Note: Although I am Watershed Coordinator of the Upper Susquehanna Coalition, these comments only are my own opinion on the subject.

Suggestions in Italics

(a) define the next generation of tools and actions to restore water quality in the Chesapeake Bay and describe the changes to be made to regulations, programs, and policies to implement these actions;

If regulations need to be increased try to develop ones that have good nutrient and sediment reduction capacity,y but are cost effective; the following suggestions are for dairy/beef operations that are not CAFOs:

- *plot every farm(including CAFOs) with animal numbers and acreage to have a good baseline for planning (there is no database at present no matter what anyone says)*
- *assess each farm's Mass Balance to develop an overall Watershed Balance and reduce nutrients (just developing a farm mass balance will provide many farmers with enough information to implement on their own)*
- *assess farms using pertinent benchmarks to target additional remediation activities*
- *exclude cows from streams and provide alternative watering sources*
- *require streams buffers, of all types- forest, shrub grass, wetlands (don't get caught up in the it has to be forest approach-you will lose a lot of support especially from the Agricultural community)*

(b) target resources to better protect the Chesapeake Bay and its tributary waters, including resources under the Food Security Act of 1985 as amended, the Clean Water Act, and other laws;

If Targeting is truly a necessity and includes the targeting of funds then there must be a corollary that non-targeted areas should have lesser requirements, as they are not a priority source (i.e., less nutrient/sediment loading).

(c) strengthen storm water management practices at Federal facilities and on Federal lands within the Chesapeake Bay watershed and develop storm water best practices guidance;

Stormwater is more than just MS4 work. In a Watershed Framework road systems and their relation to stream hydrology is a driving factor. Target local highway programs for training (how about if a highway department gets busted have them take a natural stream design course rather than pay a fine), do not allow bare ground ditch cleaning, do allow highway departments to clean streams, make highway departments doing stream crossing work be responsible for up and downstream problems beyond thire right-of way.

(d) assess the impacts of a changing climate on the Chesapeake Bay and develop a strategy for adapting natural resource programs and public infrastructure to the impacts of a changing climate on water quality and living resources of the Chesapeake Bay watershed;

Wetland restoration, stream rehabilitation, grassed road ditches and grass-based agriculture should be implemented continuously and in parallel with climate change research. It is a logical short-term conservative approach for enhancing the landscape stability of the Bay's watershed, while looking for longer term answers.

(e) expand public access to waters and open spaces of the Chesapeake Bay and its tributaries from Federal lands and conserve landscapes and ecosystems of the Chesapeake Bay watershed;

Provide incentives to keep forests and wetlands in place. Possibly trade forestlands under easement for reduced nutrient loading requirements.

(f) strengthen scientific support for decision making to restore the Chesapeake Bay and its watershed, including expanded environmental research and monitoring and observing systems; and

Increase tributary monitoring, especially event-based to really understand the timing and source of loads. If you can't get enough samples don't bother.

(g) develop focused and coordinated habitat and research activities that protect and restore living resources and water quality of the Chesapeake Bay and its watershed.

Focus is good if it is in a watershed framework so that all watershed attributes are addressed.

b) establishing new, minimum standards of performance where appropriate, including:

(i) establishing a schedule for the implementation of key actions in cooperation with States, local governments, and others;

Take into account the complete lack of funding that may occur the next several years due to the poor economy at the state level when setting time frames. For example, NY has decided not to fund any agricultural implementation projects for one, if not two years.

(ii) constructing watershed-based frameworks that assign pollution reduction responsibilities to pollution sources and maximize the reliability and cost-effectiveness of pollution reduction programs; and

It may be most efficient to set up one simple set of rules for everyone but then provide a punch list of alternatives, check offs or exemptions to allow for the vast differences in the watershed's landscape and function.

A Watershed-based Framework

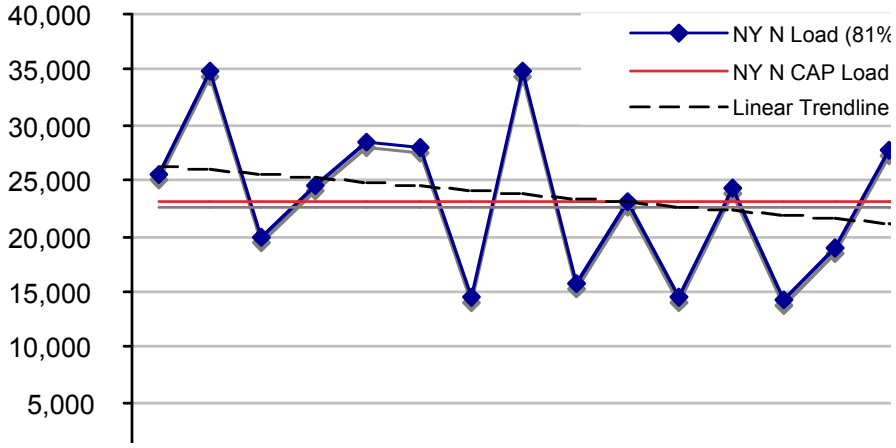
Spend some time looking at this picture. It is where the Chemung (left) and Susquehanna (right) rivers meet, just south of the NY border in PA. All of the water from NY flows by that one tree in the middle of the picture. Note two important watershed points of interest: the hilly topography and the abundant forest cover; a similar picture in MD would be much different. That is why the Executive Order explicitly states that the CB watershed needs to be addressed in a watershed context. Regional differences must be addressed.

The sediment (and accompanying P) plume in the Chemung is a result of a storm over that basin; it eroded acres of farm fields (see below). Similar events happen in the Susquehanna on different occasions. Flooding/erosion is a major NY/Bay problem and is a good example of regional rather than Basin-wide issue that must be addressed.

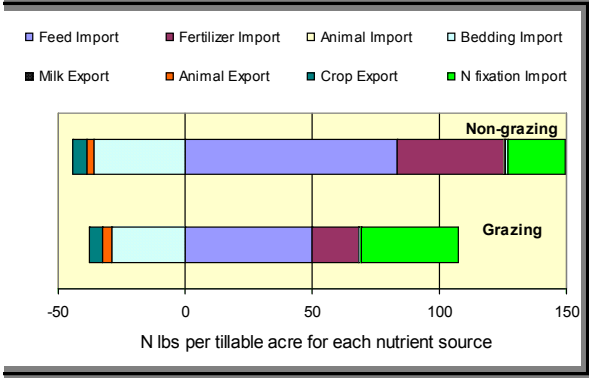
Targeting

Look again at the Tree in the first picture. It is about 300 miles from the Bay. NY's approach is to target its limited funding on implementing practices wherever they will maximize the nutrient and sediment reductions past that tree. The sediment in the picture sometimes comes from the Tioga River, sometimes Colonel Bills Creek, sometimes Meads Creek, to name a few. If we only allow funds to be used in a chosen few we would surely not be cost effective and no doubt miss opportunities. If we had separate subwatersheds that each drained directly to the Bay, such as MD, we may have developed a different approach

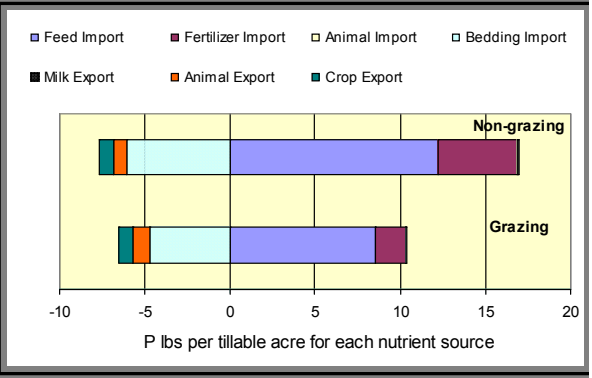
NY Edge of Stream Nitrogen Load (1989 to 2007)



Grazing farms had, on average, less N and P imports and exports. Although the average grazing farm had about 20% less N and P exported in milk, they also had between 30 and 62% less N and P imported as feed and fertilizer. Grazing farms had approximately 70% more N imported as legume N fixation than the non-grazing farms.



N import/export distribution



P import/export distribution

Note: "Milk Export" is the light blue on bar

Nutrient management is a complex issue with the potential of many unintended consequences. A nutrient management plan to be fully implemented, at least in colder regions, will require a manure storage structure to eliminate spreading manure on frozen ground. Because of the costs involved with storage this may bankrupt many small farmers. Even though there may be a nutrient reduction benefit to storage on smaller farms is it significant and cost effective in relation the Bay?

We suggest that, in the Watershed Framework Approach requested by the Executive Order, that not only could regions be targeted for heightened pollution reduction responsibilities but also other regions be targeted for lesser responsibilities based on their lack of loading. Review the NY edge of stream Nitrogen load graph. It is an example where nitrogen management fully implemented, may not be cost effective or a significant nutrient reduction practice.

The permit regulations developed for CAFO's has addressed a significant percentage of farm animals (in NY the 86 CAFO's (>200 cows) represent about 40% of the animals but less than 10 % of the farms).

We suggest the remaining farms, Small Farm Operations, SFO's, be better integrated into Bay restoration efforts through a policy action that will provide a better understanding of farm operations on a watershed scale. We suggest that a watershed goal could be developed (for example total contribution from small farm operations of x pounds of N) that would be determined through the accumulation of quality information.

1. Require each SFO to document its animal numbers and acres of crops, pasture and hayland.

2. Conduct a SFO mass balance analysis. There is a Cornell model developed that greatly expedites this operation. This should be considered a nutrient reduction practice. (Reason: On the 73 farms in the Susquehanna Basin where mass balances were done at least 64% of those reduced both their N and P excess/acre.)

3. Conduct Benchmark Feed and Forage analysis with seven targets:

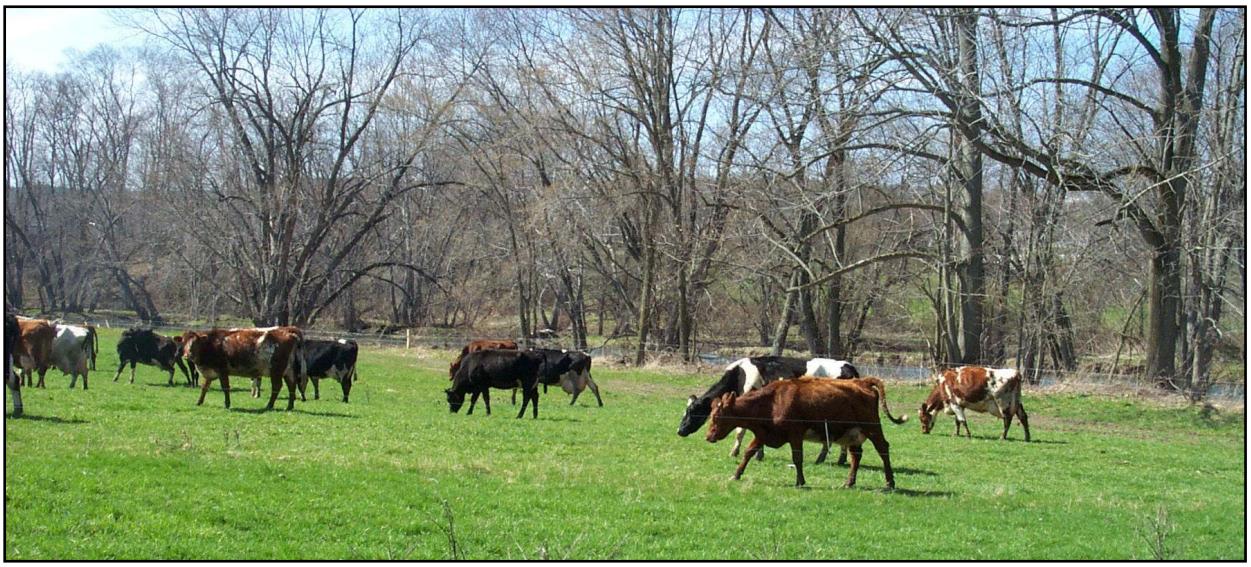
- Forage as a percent of Body Weight, Diet and Home Grown $\geq$ 60%
- Phosphorus as a percent of NRC requirements = 95% - 105%
- Diet Crude Protein < 16.5% (Jersey Cows 17.5%?)
- Milk Urea Nitrogen (MUN) $\leq$ 12
- Cows dead or culled less than 60 DIM < 5%

We caution on the practical limits of technology and the inherent differences in farm operations. Developing watershed goals based on real farm analyses will provide maximum flexibility to reduce nutrients while minimizing the chance of putting farms out of business through farm-specific requirements. The target numbers are guidelines only and not meant for incorporating into a regulation.

Excluding Cattle from Streams

- Cattle exclusion reduces direct P and N deposition by about 30%
- Cow hooves have tremendous force that destabilizes banks, (note tree with roots exposed); streams widen, become shallower, erode more, becoming a major sediment source unraveling not only in the pasture but well upstream
- Pathogen loading to the stream is a real problem not only to downstream humans but to the cows in their own pasture; cow health increases dramatically with stream fencing AND providing offsite watering

Riparian Buffers



You are looking at a buffer, look hard. There is stream beyond the cows with a thin band of trees. This grazing farm provides wall-to-wall buffers, ensuring maximum nutrient retention.

This small wetland buffers the Unadilla River from barnyard runoff. The N is so high in the runoff that it must be diluted for measurement. By the time the flow makes it to the river it has less N than the river (denitrification).

Meads Creek Watershed after an 8-inch rainstorm; watershed 80% forested, but steep.

before hydroseeding

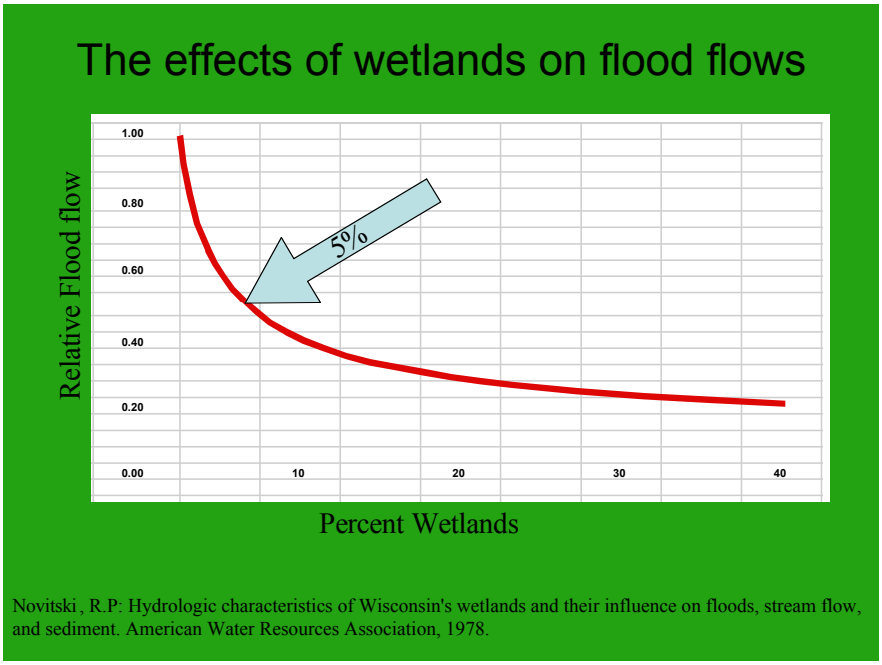
after hydroseeding

These are Stormwater issues and answers, especially in watershed regions with steep topography and flashy flooding. Road ditches are a major sediment source and many are problem areas are local, not federal roads. To put in perspective there are 17,000 miles of roads and 13,000 miles of streams in the Susquehanna Headwaters.

Potential Approach:

- Do not fund road ditch "cleaning" without approved remediation (FHWA CHIPS funds)
- Do not fund highway maintenance on culverts without hydrological/natural stream analysis approval

Wetlands: Flood and Drought Attenuation, Nutrient and Sediment Reduction and Habitat Diversity, A Key Component to address Climate Change?



Wetland preservation, enhancement and restoration are a key because of the wetland's capability to retain sediment and nutrients and maintain stream flow. Wetlands, especially in tributary watersheds, through their water holding capabilities and their vegetation desynchronize rainfall runoff events, thus reducing flood peaks while sustaining baseflow (Carter et al. 1978). Placement of wetlands in the upper reaches of a watershed will impede surface runoff and can reduce downstream erosion (Baker 1993). Novitzki (1985) found that a watershed with about five percent wetlands could have a 50 percent reduction in peak flood flows compared to a watershed that had none.

We suggest that all aspects of wetland protection and restoration be promoted while climate change research is conducted. We need not wait for results to enhance wetlands now.