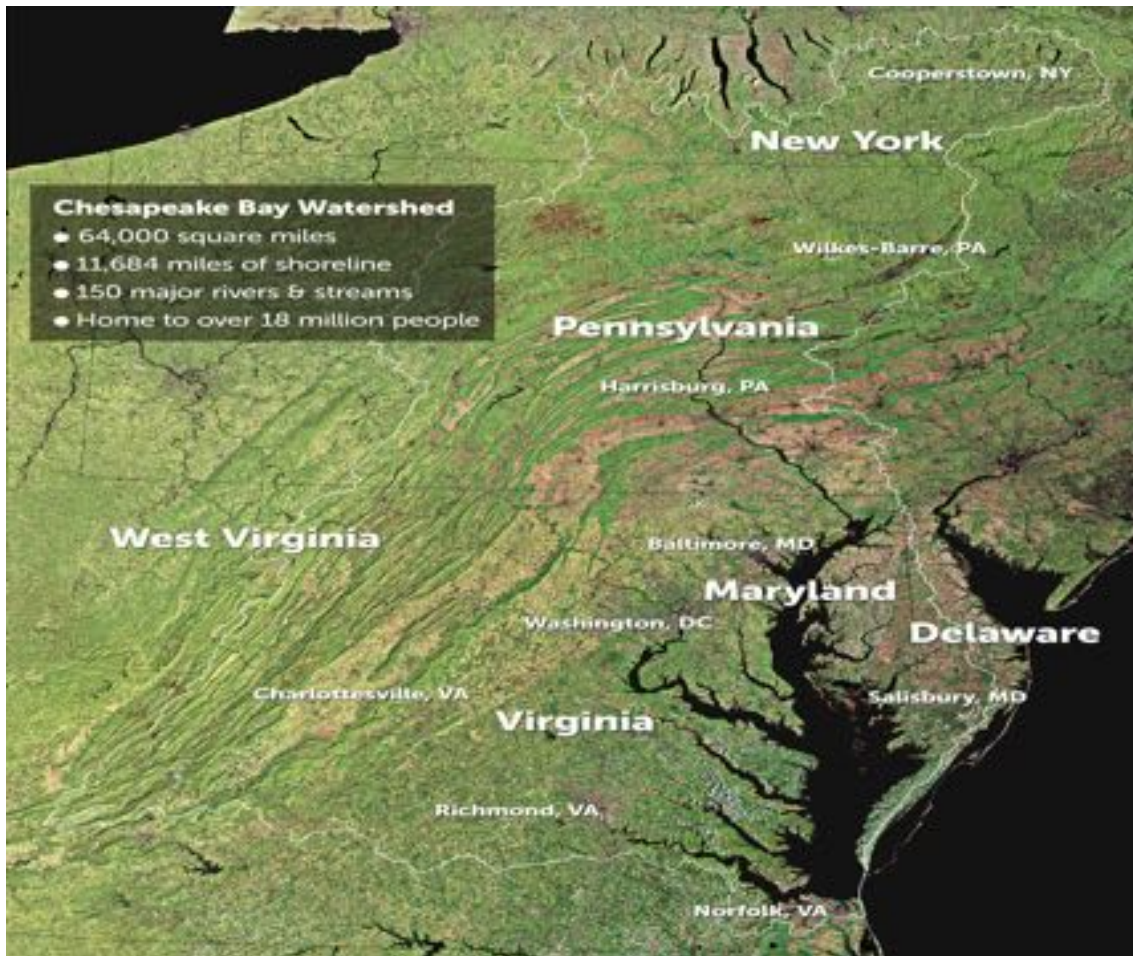


**2020 Northeast Pasture Consortium Conference Proceedings
January 15-16, Lake Morey Resort, 82 Clubhouse Road, Fairlee, VT**

Session 6 – Pasture Management Practices for Achieving the Chesapeake Bay Watershed’s TMDL Goals

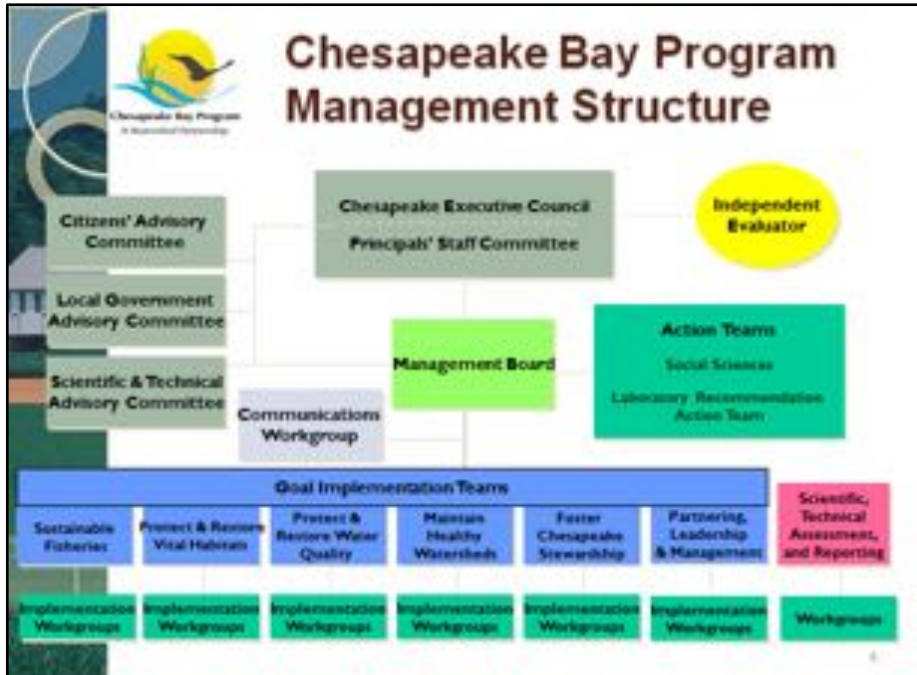
Mark Dubin, Chesapeake Bay Program Senior Agricultural Advisor, University of Maryland Extension, Department of Environmental Science & Technology at Annapolis, MD requested to have the opportunity to bring the Northeast Pasture Consortium up-to-date on the Chesapeake Bay Program use of pasture management practices to meet the 2025 total maximum daily load allowed of nitrogen (N), phosphorus (P), and sediment entering Bay streams and waters. We made time for him in the Conference program. James Cropper, Executive Director, has been a member of the Agricultural Work Group since 2009 and also was a member of the Nutrient Management subcommittee of that group. He provided them guidance on N, P, and soil loss from pastures for version 6.0 of the Chesapeake Bay Watershed computer model.

Mark started his presentation by giving some facts about the Chesapeake Bay Watershed and how the Chesapeake Bay Program is structured managerial.



Chesapeake Bay Watershed is large. The Susquehanna River is a major tributary entering the Bay from the north. It begins in the southern tier of counties in NY. The Potomac River is the main western tributary with headwaters in WV. The James River is the major southern tributary that runs through VA. Bay Watershed boundary is marked by a white line, somewhat indistinct at times.

2020 Northeast Pasture Consortium Conference Proceedings
 January 15-16, Lake Morey Resort, 82 Clubhouse Road, Fairlee, VT



The Northeast Pasture Consortium is represented in the Agricultural Work Group that is under the Goal Implementation Team, Protect & Restore Water Quality

2020 Northeast Pasture Consortium Conference Proceedings January 15-16, Lake Morey Resort, 82 Clubhouse Road, Fairlee, VT

The Agriculture Workgroup (AgWG) is tasked with:

- Agricultural forum for federal, state, and local agencies, conservation districts, universities, agri-business, and the corporate sector,
- Recommend prioritization of federal and state technical and financial resources on specific practices,
- Technical leadership to support the development and implementation of agricultural elements of the Chesapeake Bay TMDL, and
- Identify, define, quantify, and incorporate agricultural conservation practices into the Chesapeake Bay Program modeling tools.

Phase 3 Watershed Implementation Plans (WIPs) for TMDL Goals by 2025 is a work in progress. The Chesapeake Bay Watershed N gap has been reduced from 6.8 million pounds to 1.8 million pounds. However, it is unlikely the TMDL Targets will be greatly exceeded by a jurisdiction or major tributary by 2025. The P gap has also been reduced but is projected to still exceed the TMDL Targets by 2025. Some states' progress on N TMDL's is very good. Virginia's plan exceeds (goes beyond) their N target by 6.2 million pounds, Maryland by 1.8 million pounds, West Virginia by 0.73 million pounds, and the District of Columbia by 0.12 million pounds.

With that overview, Mark then went into agriculture and pasture management goals by state beginning with Delaware. The rate of N load reduction called for in DE's WIP is 5 times greater than the reduction rate since the TMDL, which averaged 66,000 pounds/year. Since the TMDL, 97% of DE's N load reduction came from agriculture. DE's plan calls for 5 times the level of effort from agriculture than what has been achieved by this sector since the TMDL and 17 times what has been achieved by agriculture over the long term (1985-2018), for N. The rate of P load reduction called for in DE's WIP is 2.4 times greater than the reduction rate since the TMDL, which averaged 2,300 pounds/year. Since the TMDL, 74% of DE's P load reduction came from agriculture and 26% from forests, wetlands, and stream restoration. DE's plan calls for twice the level of effort from agriculture than what has been achieved by this sector since the TMDL, for P.

Delaware's pasture management practice implementation goals are:

- | | |
|---------------------------------|--------------------------------|
| ❖ Pasture Alternative Watering | ❖ Horse Pasture Management |
| ▪ 2018 Progress – 600 Acres (A) | ▪ 2018 Progress – 0 A |
| ▪ Implementation – 12.2 % | ▪ Implementation – 0.0 % |
| ▪ 2025 Goals – 1,400 A | ▪ 2025 Goals – 0 A |
| ▪ Implementation – 35.2 % | ▪ Implementation – 0.0 % |
| ❖ Prescribed Grazing | ❖ Fenced Forest Stream Buffers |
| ▪ 2018 Progress – 100 A | ▪ 2018 Progress – 0 A |
| ▪ Implementation – 1.4 % | ▪ Implementation – 0.0 % |
| ▪ 2025 Goals – 100 A | ▪ 2025 Goals – 0 A |
| ▪ Implementation – 3.4 % | ▪ Implementation – 0.0 % |

**2020 Northeast Pasture Consortium Conference Proceedings
January 15-16, Lake Morey Resort, 82 Clubhouse Road, Fairlee, VT**

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|--|---|
| <ul style="list-style-type: none"> ❖ Fenced Grass Stream Buffers <ul style="list-style-type: none"> ▪ 2018 Progress – 20 A ▪ Implementation – 0.4 %
 ▪ 2025 Goals – 30 A ▪ Implementation – 0.7 % | <ul style="list-style-type: none"> ❖ Pasture Management Composite <ul style="list-style-type: none"> ▪ 2018 Progress – 700 A ▪ Implementation – 13.6 %
 ▪ 2025 Goals – 1,600 A ▪ Implementation – 35.6 % |
|--|---|

In Maryland, the rate of N load reduction called for in its WIP is 2.2 times greater than about twice the reduction rate since the TMDL, which averaged 530,000 pounds/year. Since the TMDL, 84% of MD’s N load reduction came from wastewater and 16% from agriculture. MD’s WIP calls for 42% of the reduction to come from wastewater and 52% from agriculture. The plan calls for 6 times the level of effort from agriculture than what has been achieved by this sector since the TMDL. The rate of P load reduction called for in MD’s WIP is about the same as the reduction rate since the TMDL, which averaged 49,000 pounds/year. Since the TMDL, 70% of MD’s P load reduction came from wastewater and 17% from agriculture. MD’s WIP calls for 23% of the reduction to come from wastewater and 40% from agriculture, with the remainder from forests, wetlands, and stream restoration. The plan calls for 3 times the level of effort from agriculture than what has been achieved by this sector since the TMDL.

Maryland’s pasture management practice implementation goals are:

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|---|---|
| <ul style="list-style-type: none"> ❖ Pasture Alternative Watering <ul style="list-style-type: none"> ▪ 2018 Progress – 35,500 A ▪ Implementation – 23.3 %
 ▪ 2025 Goals – 12,700 A ▪ Implementation – 10.0 % | <ul style="list-style-type: none"> ❖ Fenced Forest Stream Buffers <ul style="list-style-type: none"> ▪ 2018 Progress – 200 A ▪ Implementation – 0.1 %
 ▪ 2025 Goals – 700 A ▪ Implementation – 0.6 % |
| <ul style="list-style-type: none"> ❖ Prescribed Grazing <ul style="list-style-type: none"> ▪ 2018 Progress – 9,800 A ▪ Implementation – 6.4 %
 ▪ 2025 Goals – 19,500 A ▪ Implementation – 15.3 % | <ul style="list-style-type: none"> ❖ Fenced Grass Stream Buffers <ul style="list-style-type: none"> ▪ 2018 Progress – 1,200 A ▪ Implementation – 0.8 %
 ▪ 2025 Goals – 1,200 A ▪ Implementation – 0.9 % |
| <ul style="list-style-type: none"> ❖ Horse Pasture Management <ul style="list-style-type: none"> ▪ 2018 Progress – 1,600 A ▪ Implementation – 1.0 %
 ▪ 2025 Goals – 2,700 A ▪ Implementation – 2.2 % | <ul style="list-style-type: none"> ❖ Pasture Management Composite <ul style="list-style-type: none"> ▪ 2018 Progress – 48,200 A ▪ Implementation – 31.5 %
 ▪ 2025 Goals – 36,800 A ▪ Implementation – 29.6 % |

**2020 Northeast Pasture Consortium Conference Proceedings
January 15-16, Lake Morey Resort, 82 Clubhouse Road, Fairlee, VT**

In New York, the rate of N load reduction called for in its WIP is 10 times greater than the reduction rate since the TMDL, which averaged 26,000 pounds/year. Since the TMDL, 99% of NY's N load reduction came from agriculture. NY's WIP calls for 28% of the reduction to come from agriculture, 34% from developed and 28% from wastewater. The rate of P load reduction called for in NY's WIP is about the same as the reduction rate since the TMDL, which averaged 12,000 pounds/year. Since the TMDL, 65% of NY's P load reduction came from wastewater and 19% from agriculture. NY's WIP calls for 35% of the reduction to come from wastewater, 30% from developed and 20% from forests, wetlands, and stream restoration. The plan calls for 69 times the level of effort from the developed sector than what has been achieved by this sector since the TMDL.

New York's pasture management practice implementation goals are:

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| <ul style="list-style-type: none"> ❖ Pasture Alternative Watering <ul style="list-style-type: none"> ▪ 2018 Progress – 0 A ▪ Implementation – 0 %
 ▪ 2025 Goals – 0 A ▪ Implementation – 0 %
 ❖ Prescribed Grazing <ul style="list-style-type: none"> ▪ 2018 Progress – 31,800 A ▪ Implementation – 17.8 %
 ▪ 2025 Goals – 46,900 A ▪ Implementation – 39.8 %
 ❖ Horse Pasture Management <ul style="list-style-type: none"> ▪ 2018 Progress – 500 A ▪ Implementation – 0.3 %
 ▪ 2025 Goals – 750 A ▪ Implementation – 0.6 % | <ul style="list-style-type: none"> ❖ Fenced Forest Stream Buffers <ul style="list-style-type: none"> ▪ 2018 Progress – 1,700 A ▪ Implementation – 1.0 %
 ▪ 2025 Goals – 3,500 A ▪ Implementation – 2.9 %
 ❖ Fenced Grass Stream Buffers <ul style="list-style-type: none"> ▪ 2018 Progress – 900 A ▪ Implementation – 0.5 %
 ▪ 2025 Goals – 1,800 A ▪ Implementation – 1.5%
 ❖ Pasture Management Composite <ul style="list-style-type: none"> ▪ 2018 Progress – 34,900 A ▪ Implementation – 19.4 %
 ▪ 2025 Goals – 53,000 A ▪ Implementation - 43.5 % |
|---|---|

In Pennsylvania, The rate of N load reduction called for in PA's WIP is 6 times greater than the reduction rate since the TMDL, which averaged 590,000 pounds/year. Since the TMDL, 90% of PA's N load reduction came from wastewater and 7% from agriculture. PA's WIP calls for 92% of the reduction to come from agriculture. The plan calls for 67 times the level of effort from agriculture than what has been achieved by this sector since the TMDL, for N. The rate of P load reduction called for in PA's WIP is twice the reduction rate since the TMDL, which averaged 69,000 pounds per year. Since the TMDL, 63% of PA's P load reduction came from wastewater and 24% from agriculture. PA's WIP calls for 72% of the reduction to come from agriculture. The plan calls for 6 times the level of effort from agriculture than what has been achieved by this sector since the TMDL, for P.

**2020 Northeast Pasture Consortium Conference Proceedings
January 15-16, Lake Morey Resort, 82 Clubhouse Road, Fairlee, VT**

Pennsylvania’s pasture management practice implementation goals are:

Pasture Alternative Watering	Fenced Forest Stream Buffers
2018 Progress – 53,00 A	2018 Progress – 7 A
Implementation – 12.2 %	Implementation – 0.0 %
2025 Goals – 100,000 A	2025 Goals – 21,000 A
Implementation – 29.2 %	Implementation – 5.6 %
Prescribed Grazing	Fenced Grass Stream Buffers
2018 Progress – 30,500 A	2018 Progress – 400 A
Implementation – 7.0 %	Implementation – 0.1 %
2025 Goals – 168,500 A	2025 Goals – 10,000 A
Implementation – 29.3 %	Implementation – 2.7 %
Horse Pasture Management	Pasture Management Composite
2018 Progress – 0 A	2018 Progress – 84,000 A
Implementation – 0.0 %	Implementation – 19.4 %
2025 Goals – 0 A	2025 Goals – 299,500 A
Implementation – 0.0 %	Implementation – 80.4 %

In Virginia, The rate of N load reduction called for in VA’s WIP is about the same as the reduction rate since the TMDL, which averaged 1,100,000 pounds/year. Since the TMDL, 92% of VA’s N load reduction came from wastewater and 6% from agriculture. VA’s WIP calls for 76% from agriculture and 13% from developed. The plan calls for 14 times the level of effort from agriculture than what has been achieved by this sector since the TMDL. The rate of P load reduction called for in VA’s WIP is 1.4 times greater than the reduction rate since the TMDL, which averaged 93,000 pounds/year. Since the TMDL, 85% of VA’s P load reduction came from waste-water and 8% from agriculture. VA’s WIP calls for 56% of the reduction to come from agriculture, 16% from developed and 24% from forests, wetlands, and stream restoration. The plan calls for 9 times the level of effort from agriculture than what has been achieved by this sector since the TMDL.

Virginia’s pasture management practice implementation goals are:

❖ Pasture Alternative Watering	❖ Fenced Forest Stream Buffers
▪ 2018 Progress – 153,700 A	▪ 2018 Progress – 0 A
▪ Implementation – 15.9 %	▪ Implementation – 0 %
▪ 2025 Goals – 176,200 A	▪ 2025 Goals – 26,400 A
▪ Implementation – 21.2 %	▪ Implementation – 2.9 %

**2020 Northeast Pasture Consortium Conference Proceedings
January 15-16, Lake Morey Resort, 82 Clubhouse Road, Fairlee, VT**

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| <ul style="list-style-type: none"> ❖ Prescribed Grazing <ul style="list-style-type: none"> ▪ 2018 Progress – 209,200 A ▪ Implementation – 21.7 %
 ▪ 2025 Goals – 347,400 A ▪ Implementation - 41.8 %
 ❖ Horse Pasture Management <ul style="list-style-type: none"> ▪ 2018 Progress – 60 A ▪ Implementation – 0 %
 ▪ 2025 Goals – 19,900 A ▪ Implementation – 2.1 % | <ul style="list-style-type: none"> ❖ Fenced Grass Stream Buffers <ul style="list-style-type: none"> ▪ 2018 Progress – 9,500 A ▪ Implementation – 1.0 %
 ▪ 2025 Goals – 45,800 A ▪ Implementation – 5.0 %
 ❖ Pasture Management Composite <ul style="list-style-type: none"> ▪ 2018 Progress – 372,500 A ▪ Implementation – 38.4 %
 ▪ 2025 Goals – 615,600 A ▪ Implementation – 66.7 % |
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In West Virginia, the rate of N load reduction called for in WV’s WIP is 9/10 (slightly less than) the reduction rate since the TMDL, which averaged 38,000 pounds/year. WV’s planned N goal remains under the state’s 2025 target as it is currently. Since the TMDL, 48% of WV’s N load reduction came from wastewater and 42% from agriculture. WV’s WIP calls for 90% of the reduction to come from agriculture and 9% from developed. The plan calls for 3 times the level of effort from agriculture than what has been achieved by this sector since the TMDL. The rate of P load reduction called for in WV’s WIP is 1/3 the reduction rate since the TMDL, which averaged 21,600 pounds/year. WV’s planned P goal remains under the state’s 2025 target as it is currently. Since the TMDL, 70% of WV’s Phosphorus load reduction came from wastewater and 10% from agriculture. WV’s WIP calls for 58% of the reduction to come from agriculture, 14% from developed and the remainder from forests, wetlands, and stream restoration. The plan calls for twice the level of effort from agriculture than what has been achieved by this sector since the TMDL.

West Virginia’s pasture management practice implementation goals are:

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| <ul style="list-style-type: none"> ❖ Pasture Alternative Watering <ul style="list-style-type: none"> ▪ 2018 Progress – 19,600 A ▪ Implementation – 8.9 %
 ▪ 2025 Goals – 25,600 A ▪ Implementation – 12.2 %
 ❖ Prescribed Grazing <ul style="list-style-type: none"> ▪ 2018 Progress – 27,800 A ▪ Implementation – 12.6 %
 ▪ 2025 Goals – 65,900 A ▪ Implementation – 12.3 % | <ul style="list-style-type: none"> ❖ Horse Pasture Management <ul style="list-style-type: none"> ▪ 2018 Progress – 0 A ▪ Implementation – 0.0 %
 ▪ 2025 Goals – 5 A ▪ Implementation – 0.0 %
 ❖ Fenced Forest Stream Buffers <ul style="list-style-type: none"> ▪ 2018 Progress – 3,400 A ▪ Implementation – 1.5 %
 ▪ 2025 Goals – 5,700 A ▪ Implementation – 2.7 % |
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**2020 Northeast Pasture Consortium Conference Proceedings
January 15-16, Lake Morey Resort, 82 Clubhouse Road, Fairlee, VT**

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| <ul style="list-style-type: none">❖ Fenced Grass Stream Buffers<ul style="list-style-type: none">▪ 2018 Progress – 70 A▪ Implementation – 0.0 %
▪ 2025 Goals – 50 A▪ Implementation – 0.0 % | <ul style="list-style-type: none">❖ Pasture Management Composite<ul style="list-style-type: none">▪ 2018 Progress – 50,900 A▪ Implementation – 23.1 %
▪ 2025 Goals – 87,400 A▪ Implementation - 45.8 % |
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This is an ambitious plan set forth by these states in an effort to clean up the Bay. A review of the 5 practices listed is needed for readers to understand why these were chosen. Alternative watering facilities are needed where the sole source of water for pastured livestock currently comes from live streams, unprotected springs, and still bodies of water, such as ponds. Ideally, these water facilities should be more than one in number in large pastures whether they are rotationally grazed by moving livestock around them in paddocks or undivided into paddocks. Prescribed grazing is the USDA-NRCS conservation practice standard name for adaptive grazing management which varies significantly around the Nation. In the Bay Watershed, this is essentially short duration stocking (grazing) with the use of small areas of pasture called paddocks that provide enough available forage for the livestock to meet their daily demand of dry matter based on the amount of time that they are on the paddock. They are then moved to a similarly sized paddock of fresh grass while the paddock they left is allowed to regrow ungrazed for several days until it is tall/mature enough to be grazed again. There are other rotational schemes that would meet the standard that could be employed in the Watershed, hence the newer term, adaptative grazing. This is particularly true, if a farmer chose to graze riparian areas rather than fencing them off from grazing entirely as two of the other practices require. These areas might be deferred from grazing seasonally or not grazed as frequently as other paddocks that are situated away from water. This allows streambanks to heal since occupancy by livestock would be measured in days of less than a week total per year. It would help keep the stream area in herbaceous vegetation rather than reverting to brushy or tree species eventually. These could interfere with flood flows on larger streams and eventually shade pasture beyond the exclusion fence making it attractive for livestock to seek shade and lounge for hours there creating a nutrient hotspot near the “protected” waterbody. Fenced Grass Stream Buffers and Fenced Forest Stream Buffers are livestock exclusion practices to keep livestock off streambanks and entering streams to drink or cross them wherever the livestock want. Forested buffers generally are planted with nursery trees to get quick establishment. Grassed buffers, if not actively kept free of invading native brush and trees, will revert to a forested buffer within ten years. Shading of pastureland near the exclusion fence will be an issue with either practice sooner or later depending on stream orientation and where the pasture is in relation to it. North-south stream with trees will produce shade in the morning on the west side and shade on the east side in late afternoon. East-west stream will vary with the seasons, but is capable of casting tree shadows on either side, just not as far in and not much (tree branch overhang beyond the fence) at all on the south side in late fall through late winter. Horse pasture management is a low acreage practice, but needed where horse numbers are higher than the “pasture” acreage and forage production allow. This can lead to nutrient and soil loss to surface waters. Pasture management composite equals the 5 aforementioned practices acreage extent. The composite gives an idea of the overall progress being made.

2020 Northeast Pasture Consortium Conference Proceedings
January 15-16, Lake Morey Resort, 82 Clubhouse Road, Fairlee, VT

Mark said at the end of his presentation that the Maryland Governor has just directed the State Attorney General to sue Pennsylvania and the U.S. Environmental Protection Agency in an effort to protect Chesapeake Bay restoration efforts. The Governor has repeatedly called upon upstream states, including Pennsylvania, to step up and take responsibility for sediment and debris that pours into the Chesapeake Bay by way of the Susquehanna River. The Susquehanna River supplies 50% of the fresh water entering the Bay.

Public and Private Sectors Research, Education, and Technical Assistance Priorities Deliberation Breakout sessions and Report

The breakout sessions were shortened to a half hour so that the Conference could hear the two reports, private and public, before lunch on revisions and additions to the priorities for research, education, and technical assistance going forward. A slow moving snowstorm was entering the western part of the Northeast Region; therefore, the Conference needed to end by midafternoon so those not staying overnight could get home safely. The body of stakeholders, private and public, continues to foster future work in quantifying economics for ecosystem services, soil health, climate resiliency of pastures, and the viability of grazing enterprises. Here are the 2020 research, education, and technical assistance priorities:

1. Explore new methods to transfer knowledge and information to increase adoption of research findings within the agriculture community; incorporate social science research into increased adoption and technology transfer:
 - Including farm organizations and advocacy groups to additionally influence regulations and legislations.
 - USDA-ARS—keep working with and building partnerships and communicate with ARS headquarters about upcoming events.
 - Seek new contact with USDA-NRCS Chief, seek a commitment to encourage reps from every state (electronic options for joining?) and invite NRCS Chief to the 2021 NEPC Conference.
 - Strengthen Extension and university research connections, work listservs and across communication methods; —use Organic Research & Education Initiative (OREI) funding opportunity.
 - 1) Utilizing connections within Pasture Consortium; grazingguide.net
 - 2) Expand distribution list to a set list within each state for advertising date of upcoming NEPC (even if it is only a Save the Date w/o a set agenda)
 - 3) Advertise NEPC on already-existing websites and social media accounts owned by Consortium members (ex: Facebook pages, Instagram, websites)
 - 4) Invite farmers from all NEPC states (Cedar Tree grant—NE states, could apply to USDA OTT, USDA-NIFA Scott Angle) by reaching out to existing grazing networks within each state to reengage farmer participation. (Cedar Tree Foundation and NE Grazing Network as source of funding??)