

Beyond 2025 Climate Small Group:

5. Recommendation: Promote regenerative agricultural production and regionally based food systems in the Chesapeake Bay Watershed

Rationale: This approach would decrease agricultural emissions sources, increase carbon sinks, and improve health and resiliency for all cross-cutting concepts including climate change, people, clean water, shallow water habitats, and healthy watersheds.

Subcomponents:

- I. **Transform Agricultural production: a shift to regenerative agriculture** is one of the most-effective solutions to achieve multiple environmental and societal benefits. Compared to conventional systems, agroecological or regenerative production systems conserve water, improve soil, air, water quality, biodiversity, increase carbon sequestration and farm economic and climate resilience. **Regenerative systems** also reduce chemical fertilizer, pesticide, feed inputs, and emissions. Regenerative agriculture is a holistic, systems approach to farming focused on building healthy soil — the foundation of all farm productivity- **this could include the development of a CBP soil health outcome and new indicators to measure success that take carbon storage, sequestration, emissions reductions and other benefits into account. Outcome should apply to all soil related activities including food, fiber, forestry products and lawn care**
 - A. **Soil Health** is the continued and expanded capacity of soil to function as a vital living ecosystem that sequesters and stores carbon and sustains plants, animals, and humans. (Soil Health Institute and MDA). This definition speaks to creating a management system that is sustainable and considers the soil microbes as a key component of the system that drives soil functions necessary for food, fuel and fiber production.
 - B. **Soil functions necessary** for a sustainable and regenerative system are nutrient cycling, water regulation (infiltration, holding capacity/ availability), filtering and buffering pollutants/toxic contaminants, physical stability that creates and supports habitat for soil organisms beneficial to agricultural production. All of these functions are impacted or mediated by soil microbes.
 - C. **Healthy soil can be achieved by** following the six principles of soil health: 1) consider context (place, geomorphology, climate, topography, etc.); 2) keep the soil covered; 3) keep living roots in the soil; 4) do not disturb the soil; 5) integrate animals/plants; and 6) enhance biodiversity. (NRCS priority practices such as nutrient management, no till, crop rotations, diverse cover crops, rotational grazing, animal/crop integration, increased use of agroforestry/perennial cropping)
- II. **Transform Food Systems- Regionally based food systems support local/regional production using regenerative practices, sourcing, processing and distributing nutrient dense, local foods, minimizing food waste and improving producer land, capital and market access and healthy food access and sovereignty for marginalized communities.**
 - A. Historically we have worked toward achievement of the CBW agricultural nutrient reductions needed solely through BMP implementation- but this approach ignores the reality of our watershed nutrient mass imbalance and continually intensifying animal and crop production systems that supply commodities both in and outside of the watershed. That production system is undermining farmers' considerable and continued efforts to reduce nutrient pollution through BMP implementation. Increasing support for regionally based food systems combined with the other initiatives above could address this problem as well as our climate mitigation needs in multiple ways.
 - B. Responding to and encouraging demand for locally produced regenerative and organic food provides economic support and consistent markets farmers need to transition and diversify their production systems

- C. Local/regional aggregation, processing and supply networks not only support local economies, but can ensure greater supply chain flexibility and farmer share of market prices
- D. Producing livestock regeneratively (ex. use of rotational grazing and agroforestry practices) to supply local needs, combined with greater emphasis on alternative protein consumption such as legumes, grains and locally sourced seafood can reduce agricultural nutrient inputs and losses, greenhouse gas emissions, and sequester carbon
- E. Incorporating emphasis on consumption of locally sourced, sustainably produced seafood, such as oyster aquaculture, blue crab, and striped bass, as well as invasive species like blue catfish and snakehead, to include facilitating market support for these products, should be part of regional food system efforts. It has cross-cutting beneficial effects for the healthy watersheds, people and fisheries management outcomes as well.
- F. Reduction in food miles traveled can reduce emissions directly and also reduces food waste, providing additional reductions
- G. Combining local food waste and manure using varied approaches such as medium and small scale anaerobic digesters, composting and biochar production can reduce greenhouse gas emissions and help build soil health
- H. Addresses other CBP outcomes, such as environmental justice issues and healthy communities

III. Strategies for CBP approaches to address the Subcomponents above:

A. Support scientific advances in accounting for agricultural carbon/soil health and the impacts of BMPs and other climate-smart practices on soil health

1. **Consider existing and emerging technologies** for agricultural carbon/soil health accounting and how they might be used to incentivize soil health practices- include field scale economic/agronomic/environmental practice-based modeling tools and field scale soil health indicators testing methods that can be economically/efficiently scaled watershed wide.
2. **Use BMP Co-Benefit approach to** - research, promote, and credit BMPs that provide results for multiple Bay outcomes in multiple ways- nutrient/sediment/toxics/carbon reductions and on farm economic benefits. For example, agroforestry BMPs build food security, clean air/water/soil, sequester and store carbon, increase biodiversity & habitat, diversify farm operations and income, build soil health, improve livestock conditions

B. Identify strategies within the CBP framework to further incentivize policies and practices that benefit soil health and promote regenerative regional food systems

1. **Research and workshops**- for example, ecosystem service markets and ways to integrate their use into the CBP structural framework, policy incentives and support, funding support, Agricultural Advisory Committee input, EPA policy and enforcement authority-to include incorporating new indicators of success for milestone evaluations, and workgroup initiatives, for example, local government outreach- planning for local food procurement or waste reduction
2. **Consider other ways to mitigate agricultural climate and water quality impacts**, such as improved tracking, modeling, implementation of manure transport, as well as modeling of waste to energy, manure treatment, perennial biofuel feedstocks, soil amendments, Agri-solar production, land conversion and conservation scenarios for best outcomes

C. Evaluate how the current CBP structure could be modified to promote the long-term, systemic change needed to move towards regenerative regional food systems. This shift requires investment and support to enable systemic transition: educational, structural, physical, psychological, emotional, and economic. The current CBP governance structure may not allow us to take steps needed to support

wholesale agricultural and food systems transformation. The CBP partnership should consider what organizational changes are needed in the current structure in order to effectively address these issues. For example, how can we build in the ability to consider the current economic and market forces that prevent the achievement of these and other Bay Outcomes- and then develop mechanisms of change needed to move forward.

- 1. Use education, behavioral science implementation and marketing resources** to ensure that farmers understand the role that soils play in healthy and profitable agricultural production systems and consumers understand the value of regeneratively produced food, purchasing choices, patterns of consumption, waste reduction, and local sourcing for healthy communities
- 2. Develop mechanisms to address issues of regional carrying capacity** and nutrient mass imbalance and to support affordable healthy food access, food security, equity, and a circular approach to food and manure waste management
- 3. Consider ways to phase the transition** over an extended time frame to ensure that it is manageable

D. Expand and increase collaboration with other entities that share common goals around regenerative and regional-based food systems: farmers and other food producers states/counties, corporations, agencies, academia, non-profits, and business entities-distributors, aggregators, processors. Assess needs/gaps/barriers, resources, areas of overlap, collaborative potential- consider the development of a Chesapeake Bay Certification Program

- 1. Federal Agencies:** Existing Climate Action Plans, systemic resilience
 - EPA:** food & animal waste reduction, waste to energy
 - USDA:** Climate Smart Agricultural Initiative: focus on more resilient local and regional food production, ensuring access to healthy and nutritious food in all communities, building new markets and streams of income for farmers and producers using climate-smart food and forestry practices, includes National Agroforestry Center, regional Food Centers and Climate Hubs, Climate Smart Commodities Initiatives in all USDA agencies- US Forest Service (USFS), Natural Resource Conservation Service (NRCS), National Institute of Food and Agriculture (NIFA), Agricultural Research Service (ARS), Farm Services Agency (FSA), Sustainable Ag Research and Education (SARE)
 - Dept. of Defense (DOE):** supply chain resilience
- 2. States and Counties:** Climate Action Plans, Local Food and Soil Health Initiatives, governments and county conservation districts.
- 3. Corporations:** ESG (Environmental, Social, Governance) reporting requirements for GHG emissions, investment risk reporting, divesting
- 4. Business entities:** agricultural and food systems-aggregators, processors, distributors, service and marketing, ecosystem services, technical service providers-public and private, Farm Bureau, agricultural cooperatives, growers' associations.
- 5. Academia and Extension:** agricultural and food systems resiliency, Johns Hopkins Center for Livable Future, Harry Hughes Center, UMD-PSU Collaboration- Thriving Ag, all land grant universities.
- 6. Non-profits/NGOs, Tribes-** agricultural and food systems resiliency, Grazing Alliances, 4R Alliances, CBF, Rodale Institute, PASA, Soil Health Coalition, Riverkeeper and Watershed Associations, American Farmland Trust, Church organizations, and Native American tribes in the Chesapeake Bay watershed.

Supporting Statements:

Vision:

The Bay Program is seeking ways to ensure that the Bay functions as a healthy, balanced watershed ecosystem that can adapt to the effects of climate change. The health of the agroecosystem and community ecosystem are integral parts of that larger ecosystem. This recommendation seeks to address the critical role those smaller ecosystems play in the health of the larger ecosystem and provide for mechanisms of transformation.

People Considerations: Regeneratively produced food results in improved environmental and economic indicators for all inhabitants of the watershed (air, soil, water quality, climate benefits, animal welfare), regional food systems improve access to healthy food, support the economy, and take into consideration the limits of productive capacity to ensure the health of the community

Cross Program Considerations: Explore role of Agricultural Advisory Committee in advancing recommendation. Explore collaboration between AgWG, Forestry WG, Chesapeake Agroforestry Network, LGAC, Toxics WG, CAC, Diversity WG, fisheries WG,

Value

Would necessitate the development of a CBP soil health outcome and actions to support local/regional agricultural food systems within the current framework, as well as reconsideration of CBP organizational structure to allow for effective ways to address systemic change and more relevant indicators of success. It requires an organizational structure that includes mechanisms for a systems based approach to change

Supporting Links:

Soil Health and Regenerative Production:

<https://farmland.org/soil-health-case-studies/>

<https://soilhealthinstitute.org/our-work/initiatives/economics-of-soil-health-systems-on-30-u-s-farms/#overview>

Lawns: <https://extension.umd.edu/resource/improve-soil-health-climate-resilient-garden/>

Using climate-smart food and forestry practices:

<https://www.usda.gov/climate-solutions>

NACD, the Soil Health Institute, and NRCS recently released economic findings from 30 farmers who adopted soil health management systems. Link to Story map

<https://storymaps.arcgis.com/stories/04966854d9c84b9784fed74d5b6ddfc2>

Food Systems Transformation Supporting Information:

Healthy Food Access Policy Compendium for Metropolitan Washington (MWCOC)

<https://www.mwcog.org/committees/food-and-agriculture-regional-member-policy-committee-farm-/>

Waste to Energy Farm Solution Case Studies:

https://mda.maryland.gov/resource_conservation/Pages/sustainable-chesapeake.aspx

USDA: Framework for Shoring Up the Food Supply Chain and Transforming the Food System to Be Fairer, More Competitive, More Resilient:

<https://www.usda.gov/media/press-releases/2022/06/01/usda-announces-framework-shoring-food-supply-chain-and-transforming>

The Chesapeake Foodshed Assessment:

Create a Chesapeake Regional Food System “brand” and unified certification system.

https://agmr.umd.edu/sites/agmr.umd.edu/files/documents/Hughes%20Center/2019_Chesapeake-Foodshed-Assessment_02.pdf

Fifth National Climate Assessment: Chapter 11 Agriculture, Food Systems, and Rural Communities Full report available online at: nca2023.globalchange.gov

Appalachian Sustainable Development <https://www.asdevelop.org/>

<https://www.asdevelop.org/programs-resources/food-hub/>

Case Study: Regenerative Local Production

<https://whiteoakpastures.com/pages/our-transition>

CBP Short Video

<https://www.chesapeakebay.net/discover/videos/chesapeake-climate-regenerative-farming>