Status of Nutrient Mass Balance
What is the Delmarva Land and Litter Challenge?

Diverse group of stakeholders committed to the following goals by 2025:

• *Delmarva agriculture is regionally neutral in importing and exporting nutrients, and wherever possible, nutrients are recycled locally to support sustainable agricultural operations; and*

• *nutrients are utilized in farming operations without negative environmental impacts.*
Governance Structure

Steering Committee (up to 27 members)
  Executive Committee (Chair, vice chairs, at large members)
  Manure Transport Subcommittee
    Recently released “Model Poultry Litter Transportation Program Attributes”
  Innovative Solutions Action Team
  Mass Balance Subcommittee

www.delmarvalandandlitter.net
CHARGE

• “Calculate, based on current information, the mass balance of nutrients on the Delmarva Peninsula.”
  • Entire Delmarva – not just the Chesapeake Bay Watershed portion of the Delmarva.
  • All Nutrient Sources – not just poultry litter.
OUR END GAME

• County level nutrient balance for Delmarva.
• DLLC consensus on best available data.
• Starting point for finding solutions to county-level surpluses.
  • Manure transport – getting the surplus nutrients to ag lands that need it.
  • Alternative uses - beyond ag land application
Mass Balance Subcommittee

- Alisha Mulkey (MDA)
- Amy Shober (UDEL)
- Beth McGee (CBF) *
- Chris Brosch (DDA)
- Clint Gill (DDA)
- Darrell Marshall (VADOF)
- Ed Kee (former Sec DDA) *
- Hans Schmidt (MDA)
- James Adkins (UDEL)
- James Glancey (UDEL)

- Jarrod Miller (UMD)
- Jeff Horstman (MRC)
- Kelly Shenk (EPA) *
- Kenny Bounds (DDA)
- Lindsay Thompson (MD Grain Producers)
- Louise Lawrence (MDA)
- Mark Reiter (VA Tech)
- Matt Johnston (UMD)
- Mike Phillips (Perdue)
- Richard Snyder (VIMS)

* co-chairs
Two Approaches

• Crop need

• Crop removal
CROP NEED METHODOLOGY

sources

- Nutrients produced or sold on Delmarva
- Inorganic fertilizers
- Manure
- Bio-solids
- N fixation
- Soil P

removal = Surplus or Deficit

- Manure exported out of Delmarva or to Perdue agricycle
- Nutrient application based on crop yield
- No application of P on soils > ? FIV
CROP REMOVAL METHODOLOGY

**sources**

- Nutrients produced or sold on Delmarva
- Inorganic fertilizers
- Manure
- Bio-solids
- N fixation
- Soil-P

**removal**

- Manure exported out of Delmarva or to Perdue agricycle
- Nutrients removed by crop harvest
- No application of P on soils > \( ? \) FIV

**Surplus or Deficit**
Why Two Approaches?

• *Crop need*

*Advantage:* More relevant to “existing conditions” relative to excess nutrients b/c it is based on nutrient management recommendations of nutrients; includes soil phosphorus.

• *Crop removal*

*Advantage:* Gives insights to long-term nutrient balance at county scale e.g., are crops “mining” phosphorus?
Data gap: soil phosphorus levels

• We need data that are:
  • Relatively current
  • At a county scale
  • Publicly available
  • With associated FIV values

• MD – Has soil P FIV data that meet our needs

• DE and VA – Insufficient publicly available data at county scale. **How to fill the gap?**
DEVELOPED REGRESSION EQUATION
To Estimate % Cropland Acres over a certain P FIV Value by County

\[ y = 1.4422x + 9.8083 \]

\[ R^2 = 0.871 \]

Mass Balance Subcommittee proposing to use this relationship to extrapolate the MD P FIV Data to DE and VA.

To estimate the % of cropland acres above a certain FIV level (TBD).
NEXT STEPS

• Summer: Technical review of assumptions and inputs

• Late Summer/early Fall: MBS reconvenes to review and discuss review and reach consensus on final assumptions for analysis

• Goal: Final Report that reflects consensus of all DLLC organizations