

Outline

- Goal Setting and BMP Selection
- Engaging Private Industry and University Research
- Funding
- Monitoring
- Reporting Progress
- Verification



Goal Setting – Loads, Sectors & BMPs

- TMDL reduction goals for nitrogen, phosphorus and sediment to meet criteria for dissolved oxygen, chlorophyll a and clarity from shallow to deep water areas of the Bay
- Model simulations to determine loads needed to meet water quality criteria
- Each sector tasked with same level of reduction (%) – Equitable Approach (RETHINKING FOR PHASE 3 WIP)
- Each sector selected BMPs and their level of implementation

Maryland Innovative Technology Fund

www.dnr.maryland.gov/ccp/intechfund.asp

History and Scope

In 2007, MD and EPA championed the establishment of the **Innovative Technology Fund** to...

reduce **non-point source nutrients and sediment**.

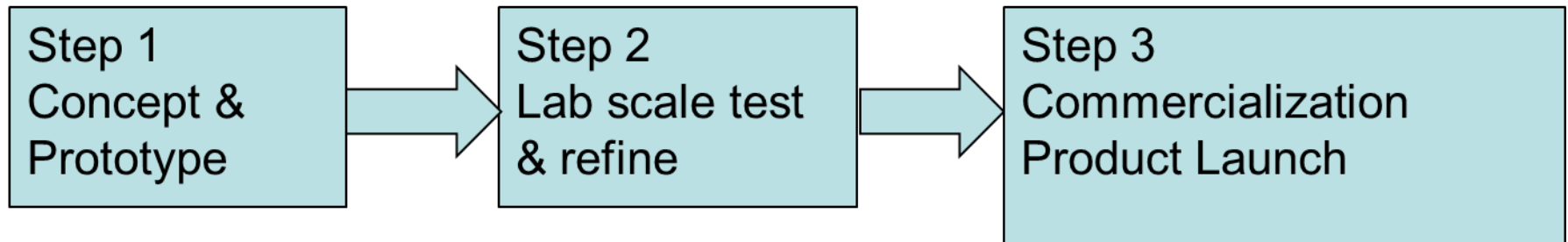
support the development of successful businesses while **creating green jobs** in Maryland.

ensure the State is always on the cusp of the **most cost-effective and efficient technologies**.

Structure: Two Branches

Fostering Collaboration and Leveraging Resources

- Research and Development with MIPS
 - Company cash match
 - Money to University researcher
- Seed Capital Fund with MTech
 - State becomes a benign shareholder



Projects

Manure to Energy

- Planet Found
- Crimson Group
- HY-TEK Bio
- Tria Systems

Urban Stormwater

- Stancills
- Smart Slope/
Furbish
- Beacon
Research

Natural Filter

- Blackrock Algae
 - Blue Wing
- Environmental
- MD Environmental
- Plastics
- ShoreThing Shellfish
 - Hollywood Oyster

Company

- Manta Biofuel
- Metompkin Seafood

Agriculture

- AviHome
- AHPharma
- NutriGrown
- GreatGrow
- High Impact
Environmental

Air Emissions

- Zymetis
- Proparts
- HyTek Bio
- Traffax

Impact

AviHome reported \$1 million in grants from the USDA CIG Program.

MD Environmental Plastics produces SAV and wetland seed pots, as well as biodegradable cull panels for blue crab, lobster and stone crab traps.

HY-TEK Bio was granted \$305,000 from the City of Baltimore to demonstrate their technology at the Back River WWTP. \$500,000 award in global innovative carbon use competition. MIPS award for their specific impact in sustainable energy.

\$3.5M invested / \$2.3M

company match

23 MD based companies

24 technologies

19.5 new jobs in MD

70 jobs retained

Supported Projects



High Impact Environmental is monitoring the runoff reduction volumes, as well as the nutrient and sediment mass removal of its cascading treatment system; a swale/basin technology to address runoff from field crop areas.





STORMWATER CATCHERS: Sam Owings redesigned his waterways with wetland cells to slow and absorb stormwater coming off uplands before trickling into the pond.

Green Roofs are vegetated rooftops which include plants, growth substrate, drainage layers and waterproofing membranes.



- Low-carbon, crushed brick substrate
- Maintained particle size and physical structure
- Adequate water holding capacities
- Light-weight, new construction and retrofit
- Stormwater retention, half storm events created runoff, retained at least 60% of the event (7 out of 10 runoff-producing events retained at least 80% of the rainfall)

By supporting innovation, the State demonstrates their commitment to investing in technology as a way to **improve efficiency and maximize return on investment...**

The Innovative Technology Fund is one of the tools Maryland will use to **meet the TMDL...**

**SO WE HAVE MORE
CRABS TO EAT!**



Funding for BMP Implementation & Technical Assistance

- Federal Funding Sources
 - NOAA - CZM
 - EPA - Water Quality Revolving Loan Fund, 319, CBIG, CBRAP
- Dedicated State Funds - Chesapeake and Atlantic Coastal Bays Trust Fund, Bay Restoration Fund
- State General Funds – Maryland Agricultural Cost Share
- Private & Non-profit

Impact Report (FY09 – FY14)



removed to-date:

2.2 million lbs Nitrogen
243,522 lbs Phosphorus
17,527 tons Total Suspended Solids



engaged:

32,190 students engaged in restoration



employed:

885 direct and indirect jobs supported



restored:

1180 acres of forest planted on State land
312 acres of wetlands restored



Monitoring

<http://mddnr.chesapeakebay.net/eyesonthebay/>

Maryland's long-term water quality monitoring results (1999-2013) indicate **overall widespread nitrogen and phosphorus improvements** as a result of nutrient reduction strategies. Based on Maryland's 126 tidal and non-tidal monitoring sites, total nitrogen (TN) concentrations are improving at 57% of sites, and total phosphorus (TP) concentrations are improving at 39% of sites.



[Water Quality Alerts & Social Media](#)

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*****NEW*****
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Click a station for more info and data

Monitoring Types & Stations

- [Continuous Monitoring](#)
- [Long-Term Monitoring](#)
- [Partners/Other Data Providers](#)

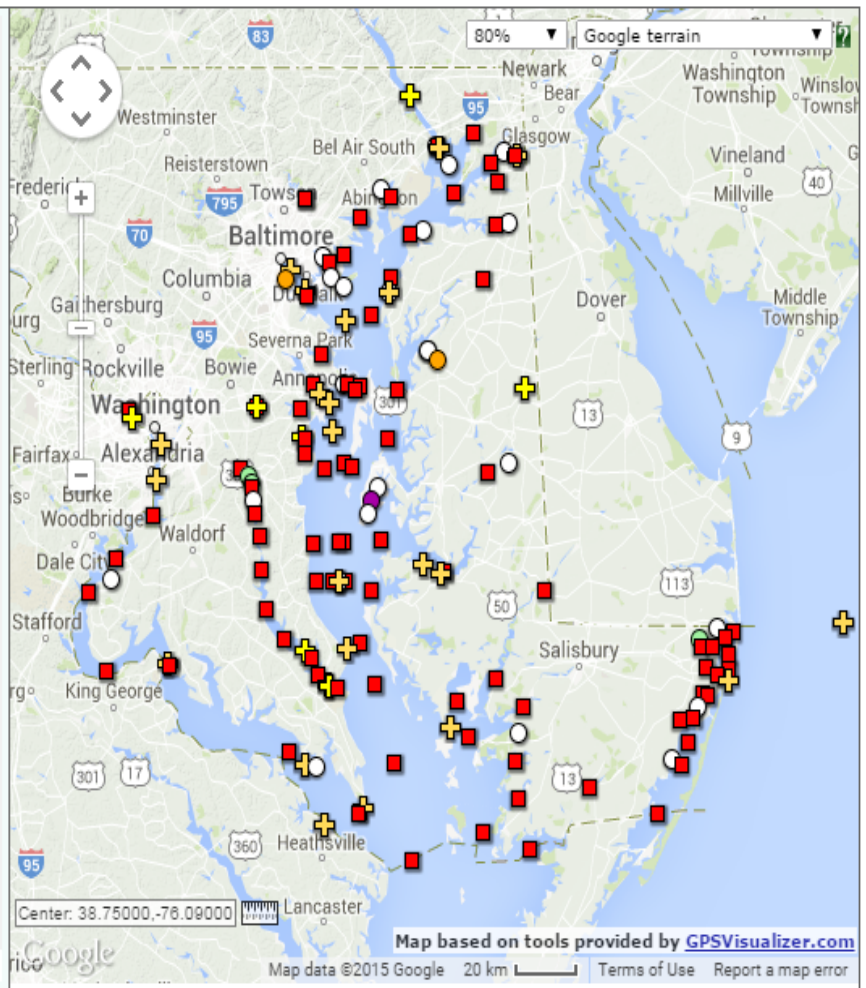
-Click Arrow to Expand Legend
-Checkbox Removes/Adds Layer
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Select Another Year for Map Display:
2015

Submit

Station Legend

- Long-Term Fixed Station
- ★ Dataflow / Water Quality Mapping Segment
- Continuous Monitoring Station with Real-time Telemetry
- Continuous Monitoring Station without Telemetry
- Vertical Profiler



Maryland's progress results for 2014 relative to 2009

- Since 2009, Nitrogen decreased by about two million pounds and Phosphorus decreased by almost 400,000 pounds. These reductions were largely due to upgrades at **wastewater treatment plants to enhanced nutrient removal, planting cover crops, following nutrient management plans and implementation of urban fertilizer laws.**



Tidal Trends

Percentage of segments showing statistically significant:	Total Nitrogen	Total Phosphorus	Total Suspended Solids (Sediment)
IMPROVING Trends (good)	27%	22%	13%
DEGRADING Trends (bad)	2%	2%	7%
No Trends	71%	76%	80%

Maryland's portion of Chesapeake Bay and its tidal tributaries are divided into 42 segments which are monitored monthly at 72 different stations by DNR for water quality. It is important to recognize that the tidal portions of Chesapeake Bay are the last areas where we expect to see improvements in water quality due to significant confounding factors such as tides, dilution with the ocean, groundwater lag times, etc.



Non-Tidal Trends

Network of 54 non-tidal (streams and small rivers) stations which are also monitored monthly for water quality.

Results for the 14 year period 1999 – 2103:

Percentage of stations showing statistically significant:	Total Nitrogen	Total Phosphorus	Total Suspended Solids (Sediment)
IMPROVING Trends (good)	44%	41%	19%
DEGRADING Trends (bad)	17%	2%	9%
No Trends	39%	57%	72%

The non-tidal stations expected to see improvements in water quality first because they are closest to the sources of pollution.



Progress Reporting

- SCD, NRCS report agricultural BMPs to MDA
- MS4 permit holders and counties report stormwater practices to MDE (SMART tool applies here); Forestry practices to DNR
- All state agencies have own verification process, then pass the data to MDE for full state submission to EPA Watershed Model
- Watershed Model has own ‘cut-off’ and ‘rules’ that could reduce BMPs allowed in State progress run
- Are the load reductions on pace to meet the TMDL goals?
 - 60% by 2017
 - 100% of practices in place by 2025



Verification

- State's providing current verification procedures to EPA in June for their critique
- Know more rigorous verification is on the horizon:
 - Number of practices
 - How verify operational
 - Discounts

