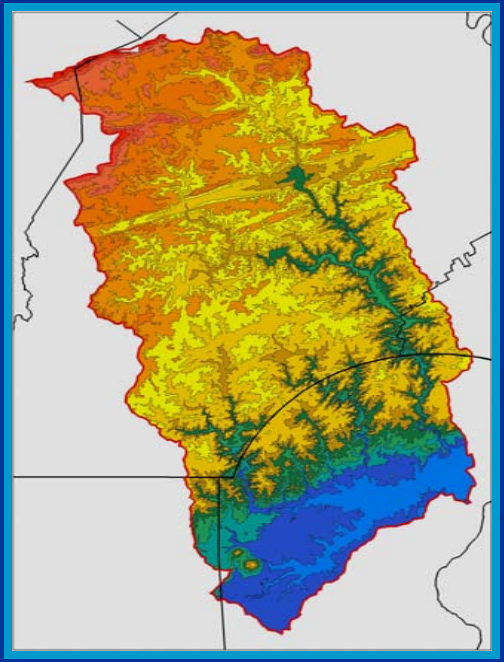
The Christina Basin: Developing and Implementing a Pollution Control Strategy to meet Total Maximum Daily Loads



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Water Resources Agency
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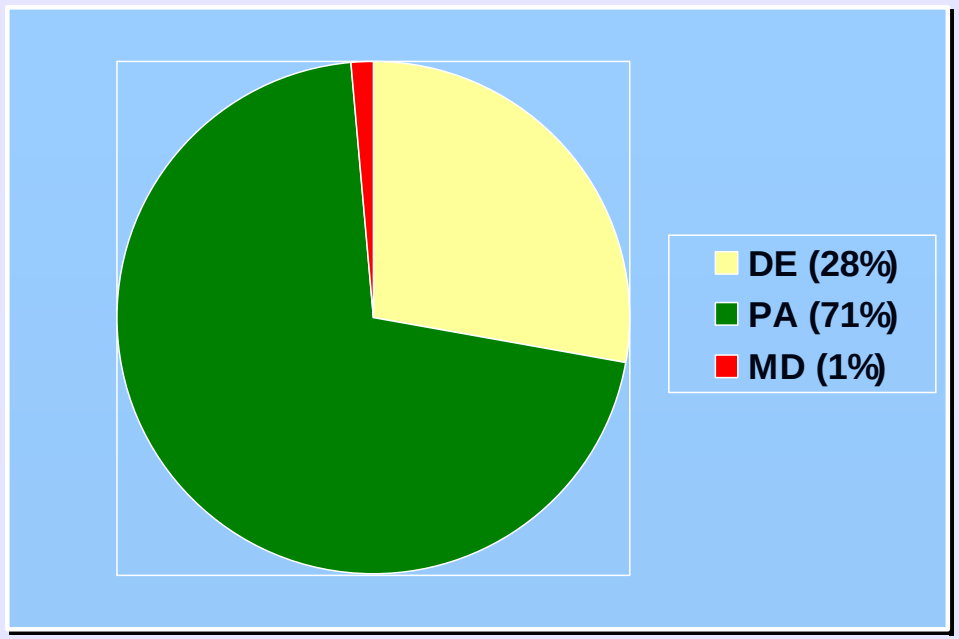
University of Delaware
March 18, 2009

The Christina Basin

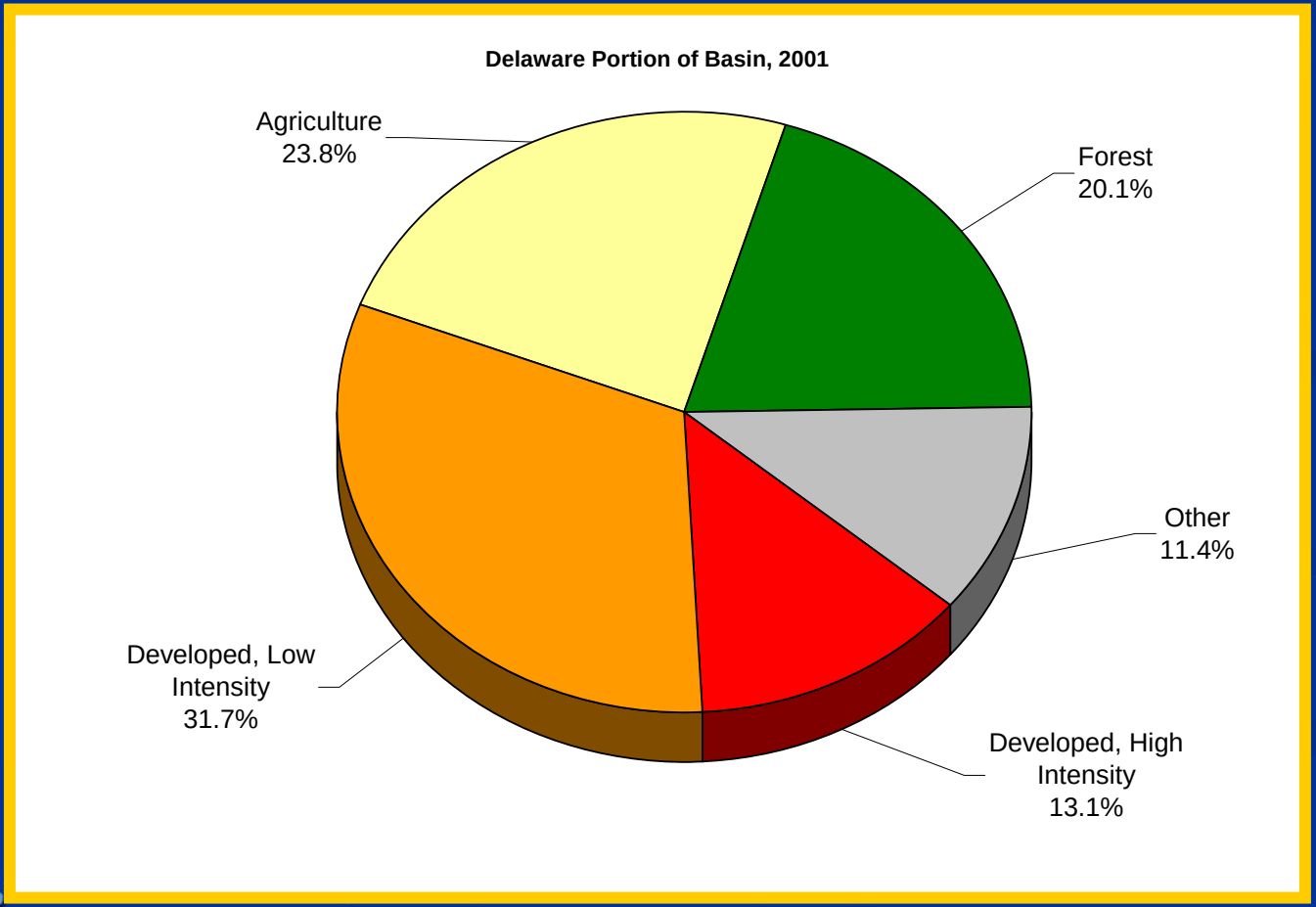
The Christina Basin
An Interstate Watershed
(565 sq.mi.)



- Brandywine Creek Watershed (325 sq. mi.)
- White Clay Creek Watershed (107 sq. mi.)
- Christina River Watershed (78 sq. mi.)
- Red Clay Creek Watershed (55 sq. mi.)

The Delaware Portion of the Christina Basin

Land Use in the Delaware Portion of the Basin (2001)



Why Should We Care?

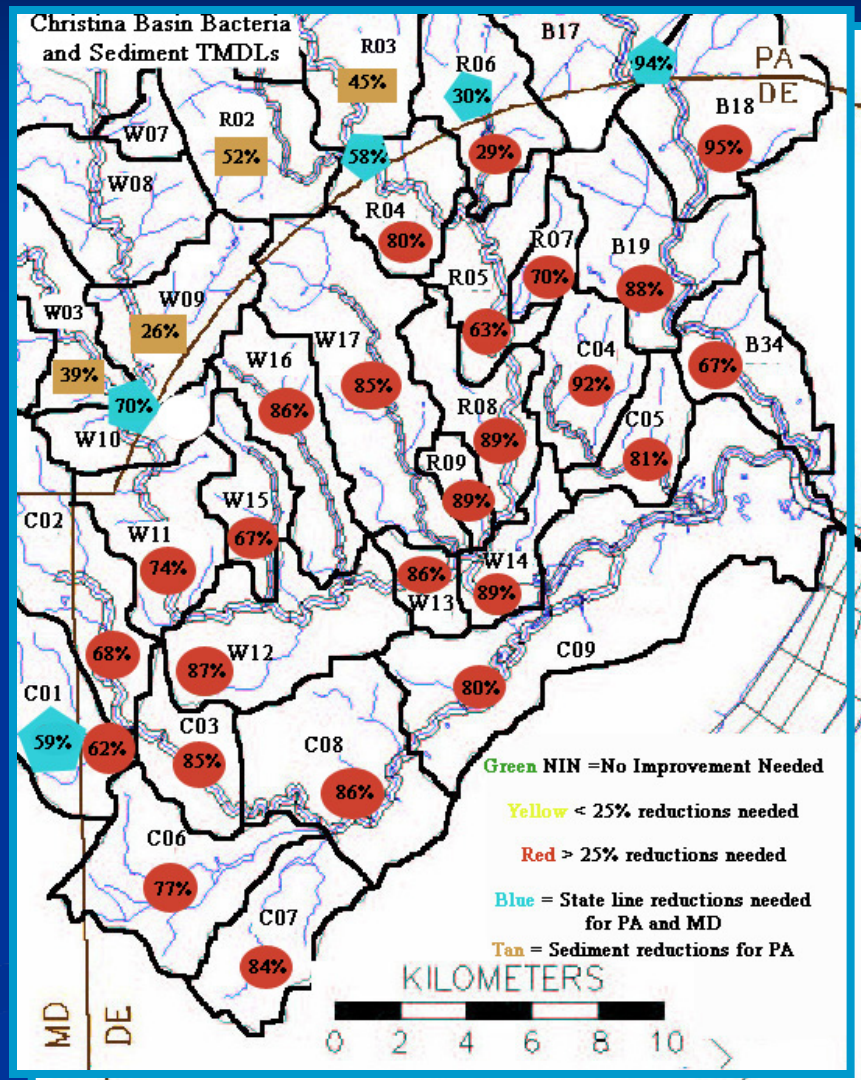
- Ecologically Significant
- Biological Diversity
- Recreational Uses
- Social, Cultural, Economic Resources
- Water Supply

TMDLs in the Delaware Portion of the Christina Basin

TMDLs

50 % (470 miles) of streams in the Basin are impaired

- Nutrients
  - Nitrogen
  - Phosphorus
- Bacteria (Pathogens)



Christina Basin Pollution Control Strategy Tributary Action Team

- **Consistent representation from approx. 30 individuals and over 20 organizations since February 2006**

Local, County, and State Government

•City of Wilmington
•City Of Newark
•New Castle County
•New Castle Conservation District
•Delaware Department of Natural Resources and Environmental Control (Watershed Assessment, Source Water, and SIRB Divisions)

Nonprofits

•Partnership for the DE Estuary
•Christina Conservancy
•Delaware Nature Society
•Red Clay Valley Association
•Homebuilders Association of DE
•WCC Wild and Scenic Program
•Natural Lands Trust

Water Utilities

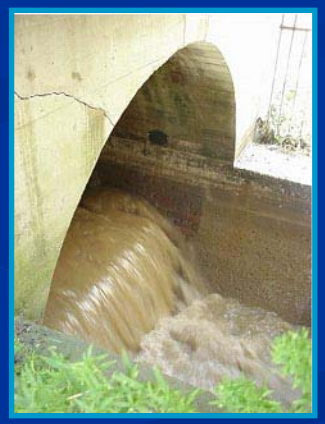
•Artesian Water
•United Water

Private Companies

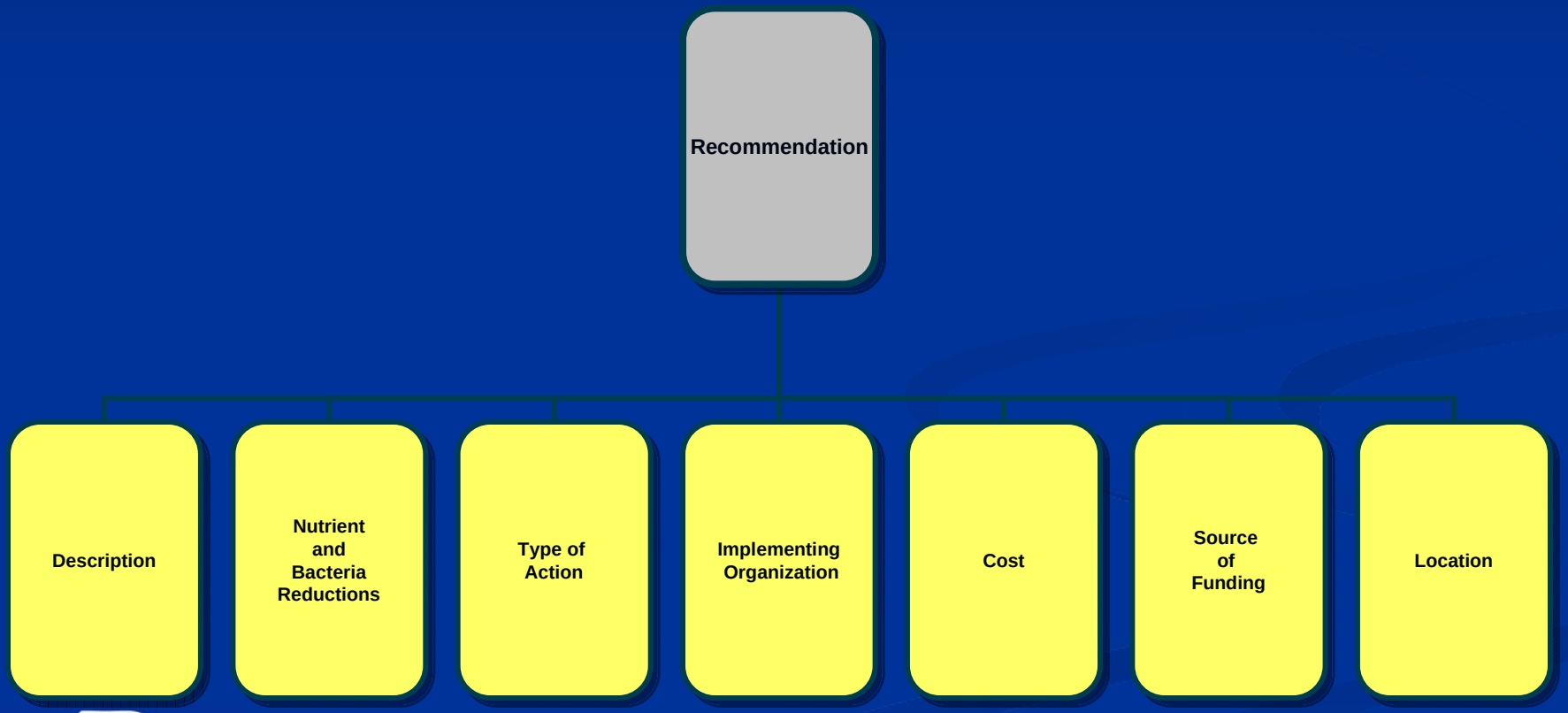
•Greeley and Hansen
•VanDemark & Lynch, Inc
•URS Corp.

Five Key Areas of Action

- Stormwater
- Open Space
- Wastewater
- Agriculture
- Education

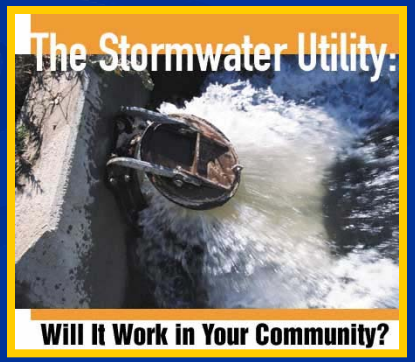


Each Recommendation Has 7 Key Components



Stormwater Recommendations

- ✓ Increase urban tree canopy
- ✓ Design sw BMPs according to the TMDLs
- ✓ Limit addition of new impervious cover
- ✓ Promote LID
- ✓ Create consistent sw ordinances
- ✓ Review development plans in the Christina Basin
- ✓ Implement a sw utility
- ✓ Retrofit sw BMPs



Open Space Recommendations

- ✓ Inventory existing vegetated areas
- ✓ Protect existing vegetated areas
- ✓ Install vegetated buffers
- ✓ Manage open space
- ✓ Implement stream restoration
- ✓ Acquire/conserve open space and retain conservation easements
- ✓ Reforest watersheds and headwaters

Wastewater Recommendations

- ✓ Install performance standards, and conduct inspections and pump-outs of Onsite Wastewater Treatment Systems (OWTS)
- ✓ Eliminate cesspools and seepage pits systematically
- ✓ Connect to centralized WWTP
- ✓ Prohibit new OWTS drainfields within 100-feet of sensitive water resource areas
- ✓ Continue inspection, repair, and elimination of separate sewer and unpermitted discharges
- ✓ Abate CSOs
- ✓ Remediate Contaminated Sites

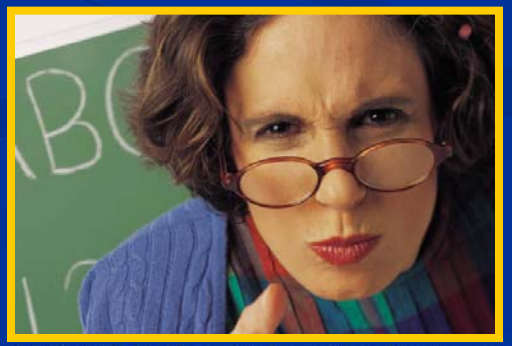
Source: www.thegormleys.com

Agriculture Recommendations

- ✓ Nutrient management plans
- ✓ Cover crops
- ✓ Pasture stream fencing
- ✓ Grassed filter strips
- ✓ Grassed waterways
- ✓ Forested riparian buffers
- ✓ Pasture and hay planting

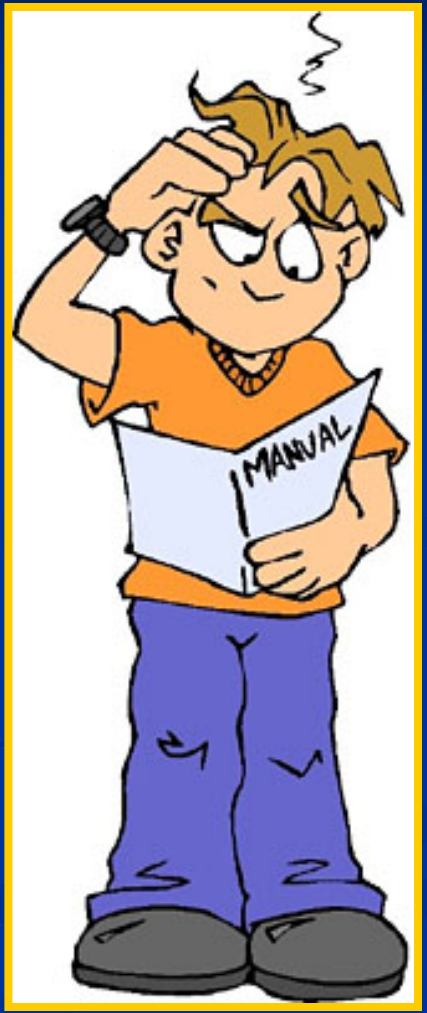
Education Recommendations

- Target behavior change
- Implement nutrient management plans for turf fields at education facilities
- Encourage golf course managers to decrease nutrient application and sw runoff
- Educate pet owners on cleaning up pet waste
- Educate homeowners on residential stormwater BMPs
- Integrate education into state and local permitting processes
- Encourage corporate environmental stewardship programs
- Coordinate nonprofit organizations throughout the Basin
- Support water conservation to reduce nutrients leaving a site
- Provide education programs on lawn and garden BMPs
- Advise DNREC to research bacteria data



Path Forward

- Submitted PCS to DNREC (November 2007)
- Implementation
  - Workgroups
  - Regulations
  - Christina Basin Clean Water Partnership
  - Projects throughout the Basin



Source: www.homestead.com

Implementation

Meet the TMDLs

Fishable, swimmable, potable by 2015

Christina Basin Tributary Action Team

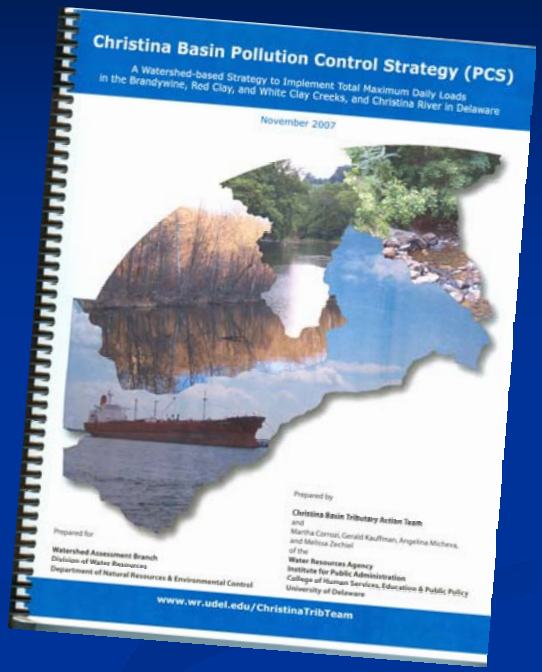
- Open Space Workgroup
- Agriculture Workgroup
- Wastewater Workgroup
- Stormwater Workgroup
- Education Workgroup

Implementation (cont.)

- Develop language for regulatory recommendations.

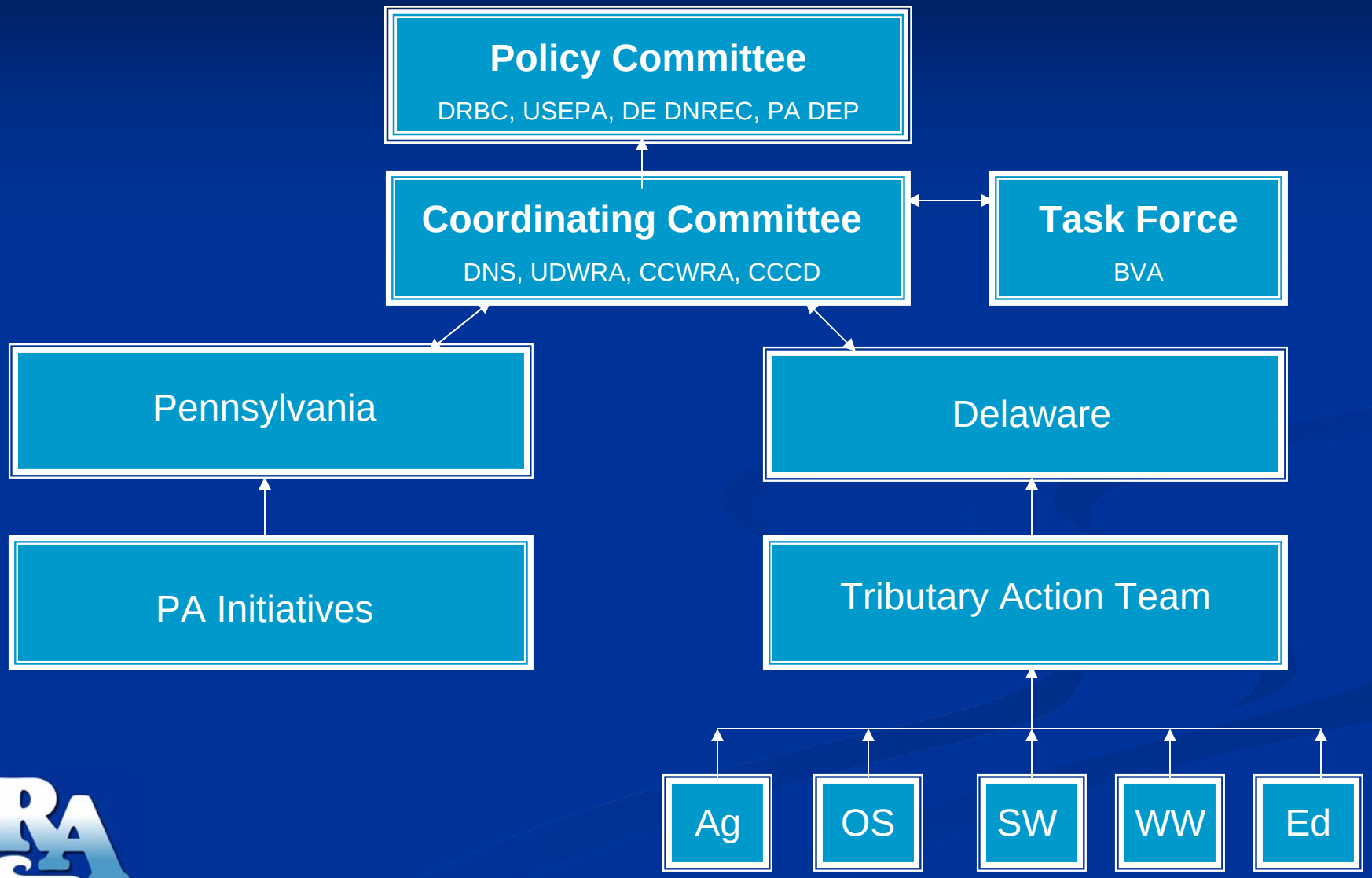
- Examples:
  - SW2: Design stormwater BMPs according to the TMDLs.

  - WW2: Install performance standards and conduct inspections and pump-outs of OWTS.



Implementation (cont.)

Christina Basin Clean Water Partnership



Implementation (cont.)

1. DNREC and IPA-WRA BMP Project
2. Trees for Wilmington Initiative
3. City of Wilmington Source Water Protection Plan
4. Christina Basin Brochure
5. Grant Funding Opportunities

THANK YOU!

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