



Department of the Environment

Water for Maryland's Future: What We Must Do Today

*Report on the Governor's Advisory Committee on the
Management and Protection of the State's Water Resources*

Presentation to the Senate Education, Health and
Environmental Affairs Committee

January 15, 2009





Maryland Faces New Challenges in Attempting to Manage Water Sustainably



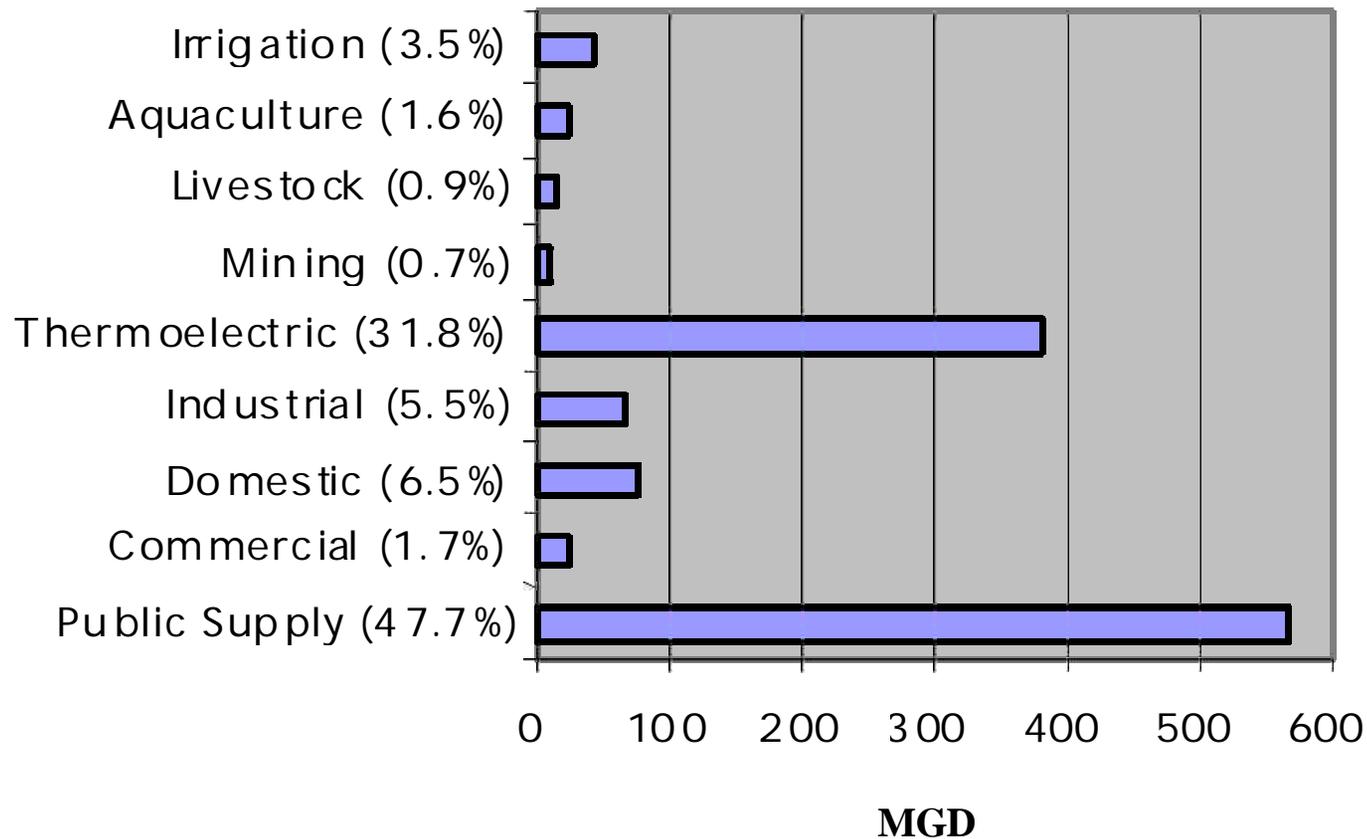
- Competition for water will increase in Maryland.
- Water quality impacts may reduce the availability of water.
- Impacts of climate change will create additional challenges.





Marylanders Use Almost 1.5 Billion Gallons of Water a Day

Maryland Water Withdrawals



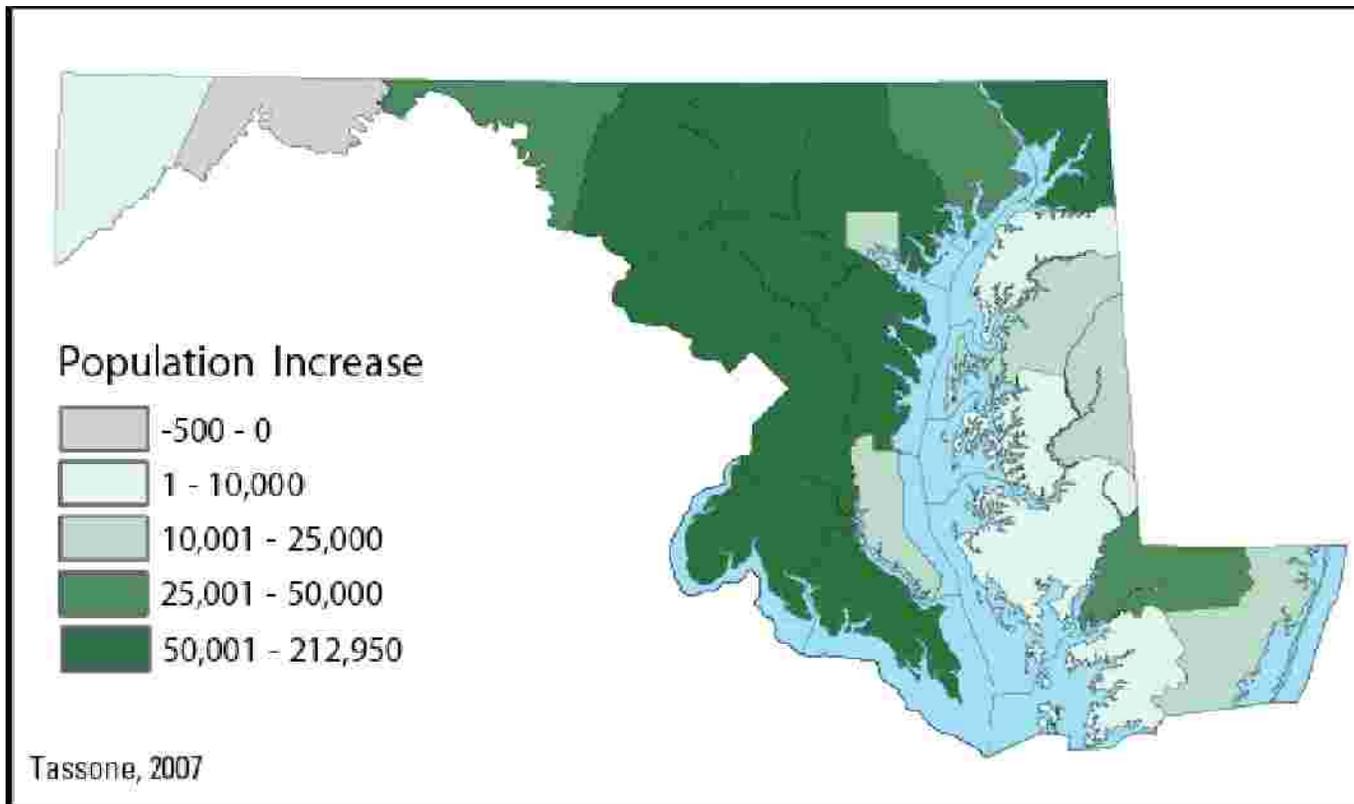


Figure 6. Projected population increases from 2005 to 2030 in Maryland.

Maryland's population is expected to increase by 1.4 million by 2030



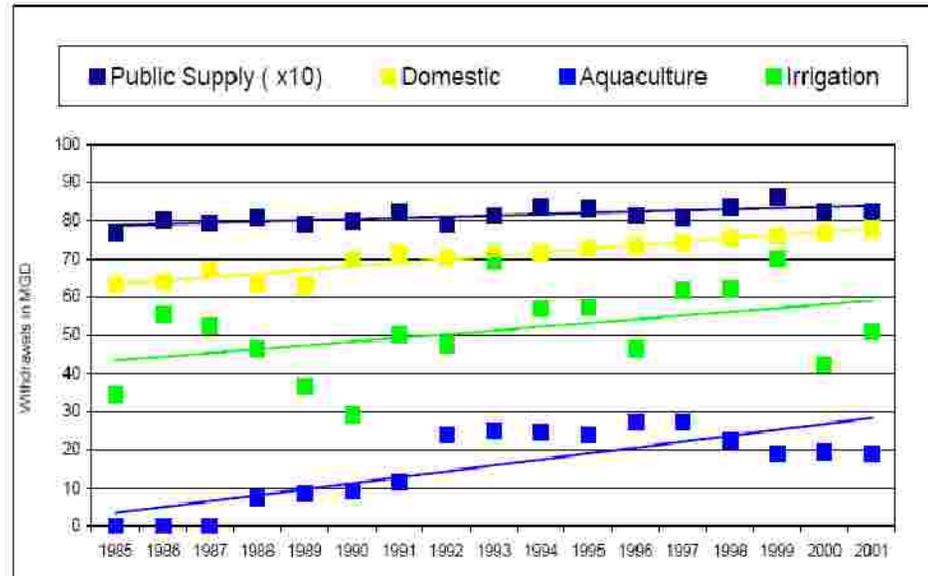


Figure 2-5. Fresh Water Withdrawal Categories that show an increasing trend from the period, 1985-2001.

- Public supply, domestic wells, aquaculture and irrigation uses are increasing.

- Commercial, industrial, thermoelectric and livestock uses have been stable.

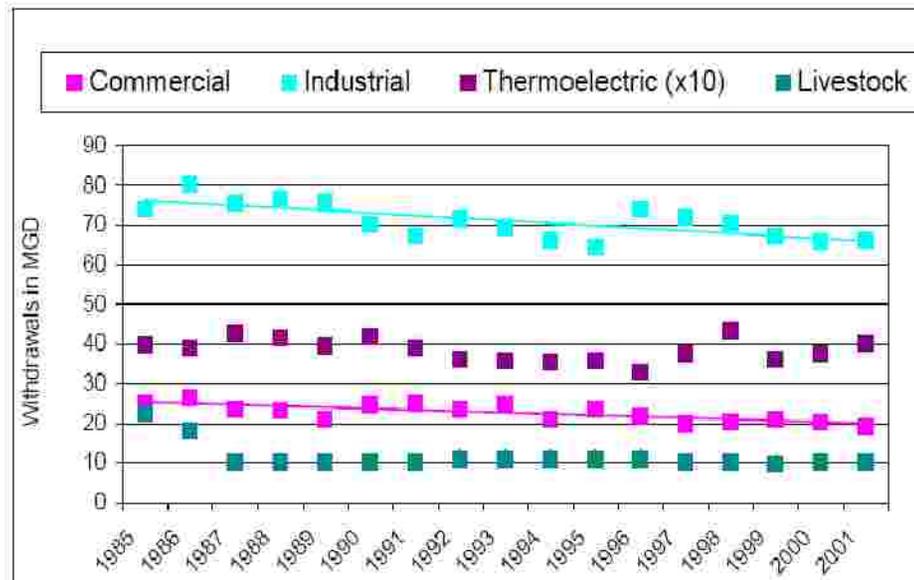


Figure 2-6. Fresh Water Withdrawal Categories that show a decreasing trend or no observable trend for the period 1985-2001.





Public supply, thermoelectric, domestic wells, irrigation and aquaculture water use in Maryland are expected to increase 16% by 2030

	<u>2000 Water Demand</u>	<u>Projected Water Demand Increase by 2030</u>
Public Supply	824	+ 58
Thermoelectric	379	+ 54
Domestic Self-Supplied	77	+ 17
Industrial	66	*
Irrigation	42	+ 84
Aquaculture	20	+ 20
Commercial	21	*
Livestock	10	*
Mining	8	*
Total	1,447 (mgd)	+ 233 (mgd)

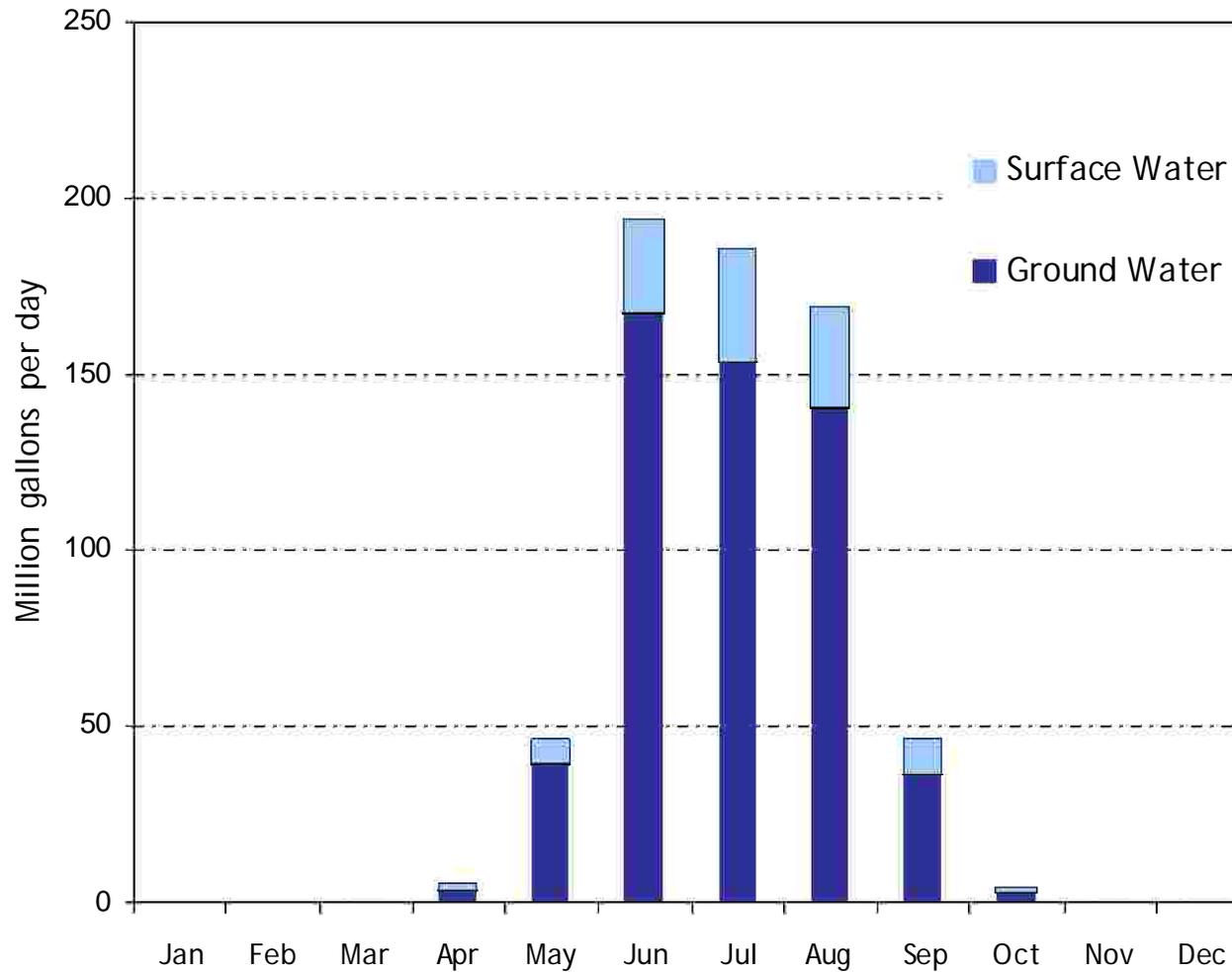
(* Not projected)





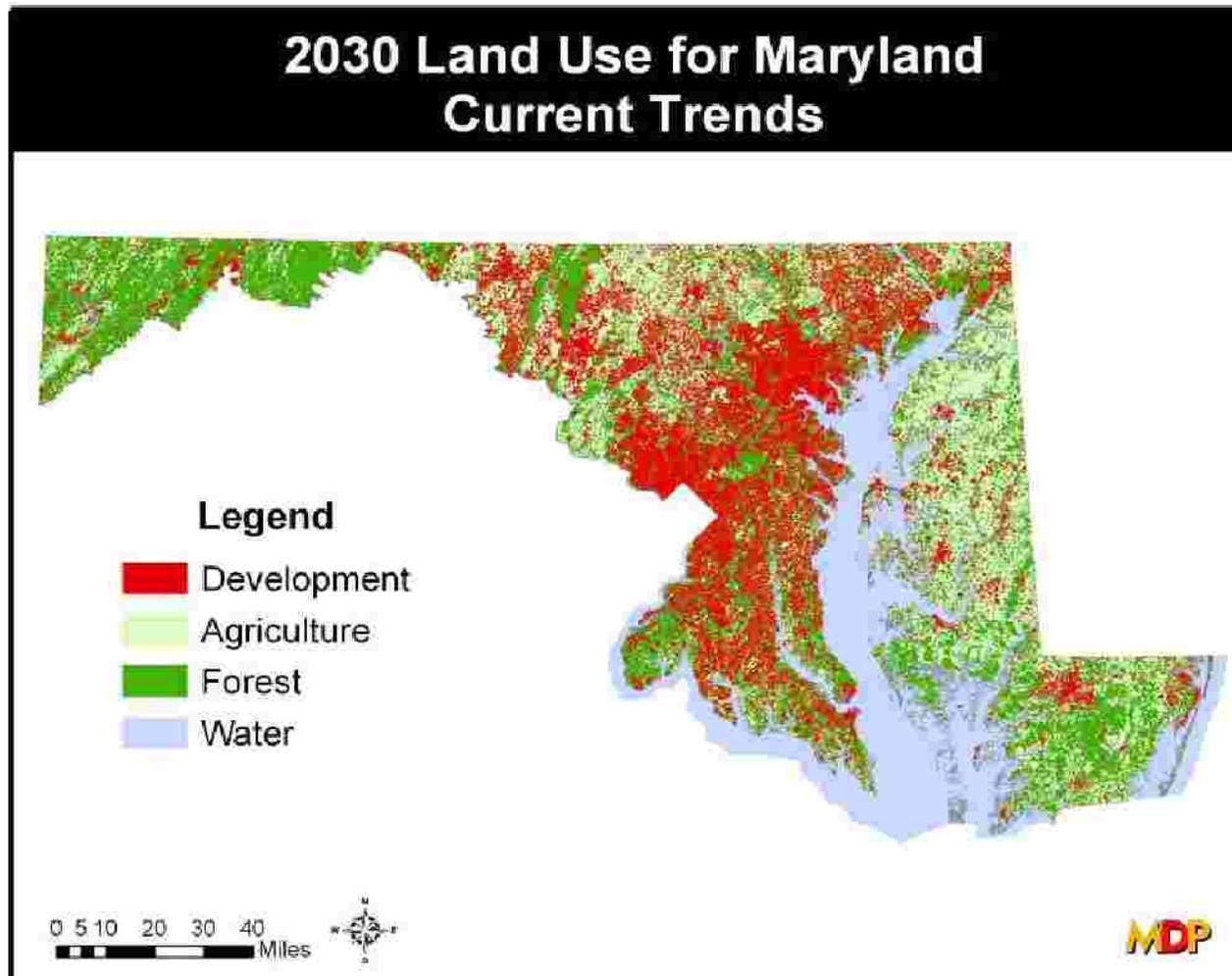
Agricultural Water Use is Expected to Increase

Irrigation Use by Month in Maryland's Coastal Plain





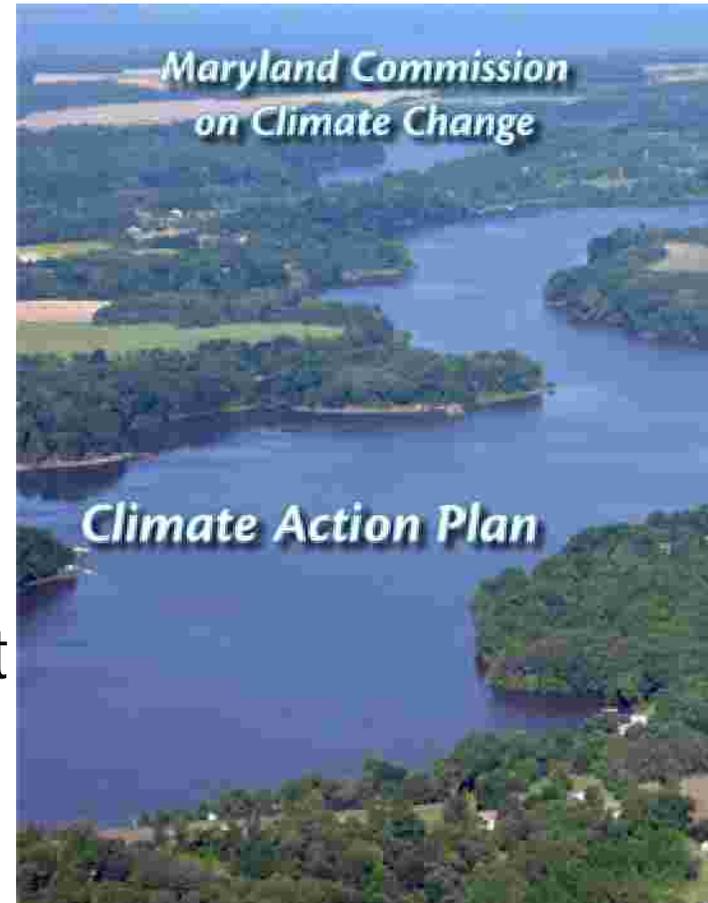
Patterns of Land Use Could Threaten the Availability of Clean Water.





Climate Change

- Patterns of precipitation will change
- Evaporation will increase
- Sea level will rise (salt water intrusion will increase)
- Higher temperatures will result in increased demand
 - Drinking water
 - Irrigation
 - Power production





In response to a record drought in 2002, 72 State Legislators drafted a letter to the Governor recommending a Statewide assessment of laws, regulations, and resources available for the protection and management of State water resources.





The Advisory Committee on the Management and Protection of the State's Water Resources was created by executive order to evaluate the ability of the State to meet its future water needs and to develop recommendations to ensure a sustainable water supply for Maryland citizens.





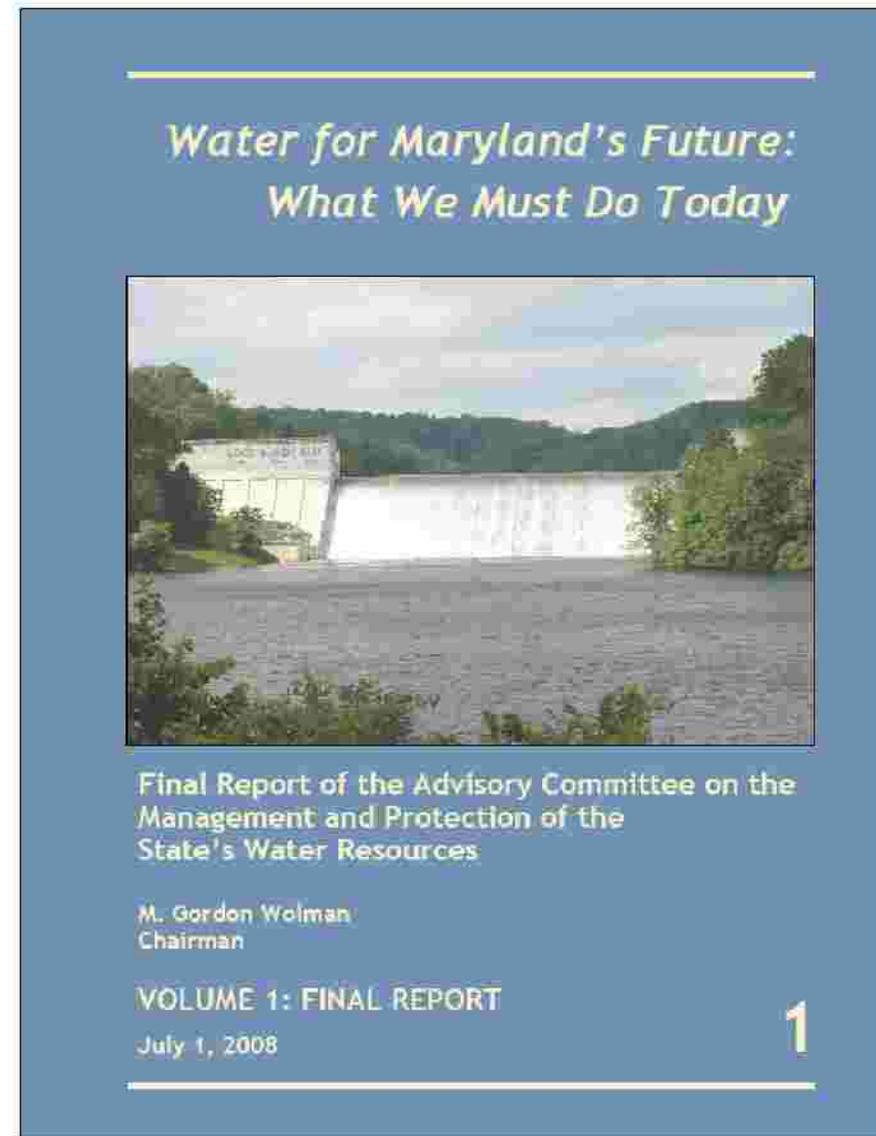
Advisory Committee Reports

- First Committee Report
May 2004
- Second Committee
Interim Report July
2006
- Second Committee
Final Report July 2008





The Advisory Committee on the Management and Protection of the State's Water Resources issued its final report to Governor O'Malley on July 1, 2008.





Key Findings

- I. Maryland must develop a more robust water resources program based on sound, comprehensive data.
- II. The staffing, programmatic, and information needs of water supply management programs must be adequately and reliably funded.
- III. Specific legislative, regulatory and programmatic changes should be implemented.





“The Committee believes that an intensified focus on water supply, including long-range planning, is needed immediately”





A More Robust Water Resources Program

- Critical basic data
- A Statewide plan
- Regional Planning

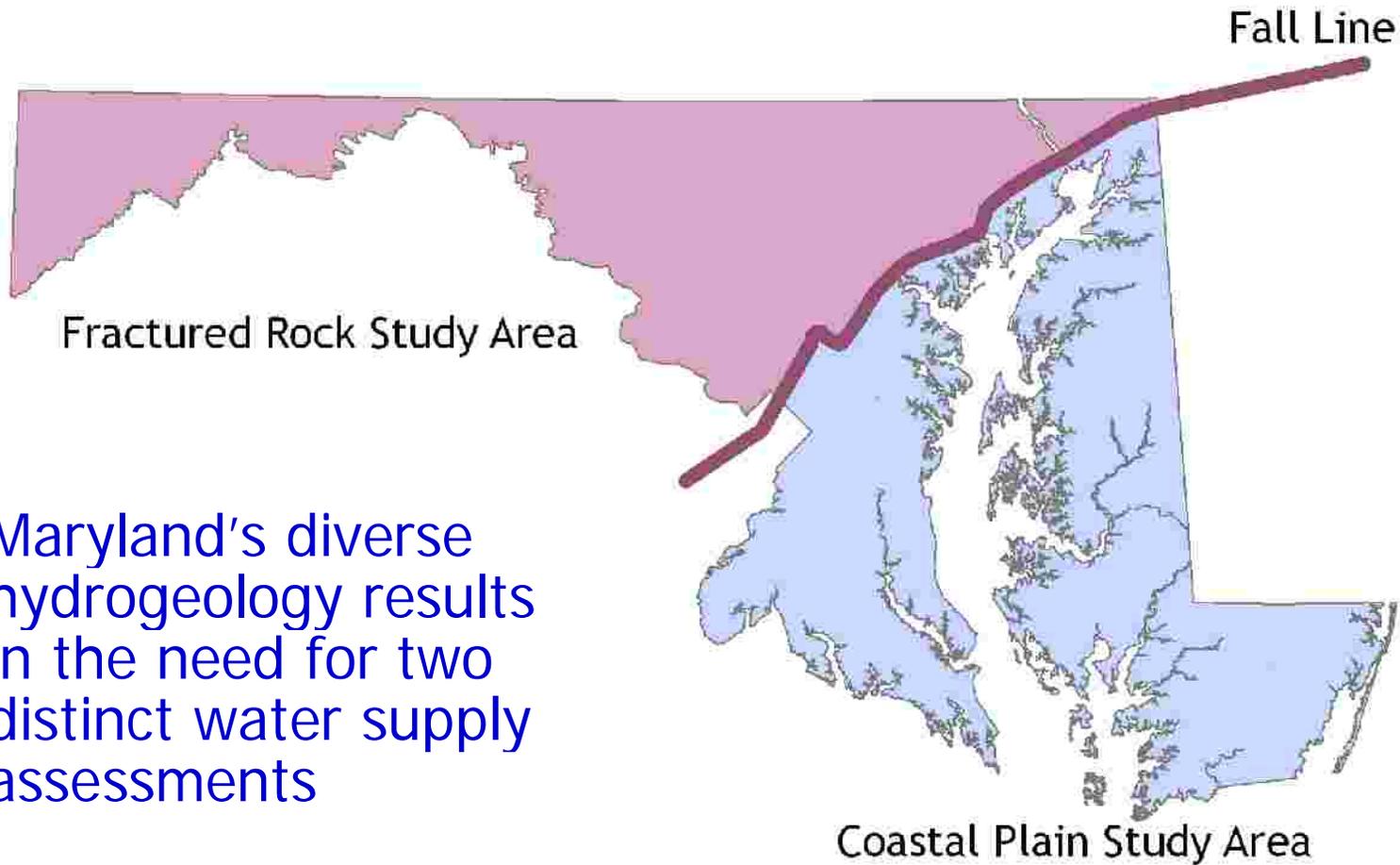




Critical Basic Data

- Coastal Plain Aquifer Study
- Fractured Rock Water Supply Study
- Expanded Monitoring Network





Maryland's diverse hydrogeology results in the need for two distinct water supply assessments





Coastal Plain Aquifer Study

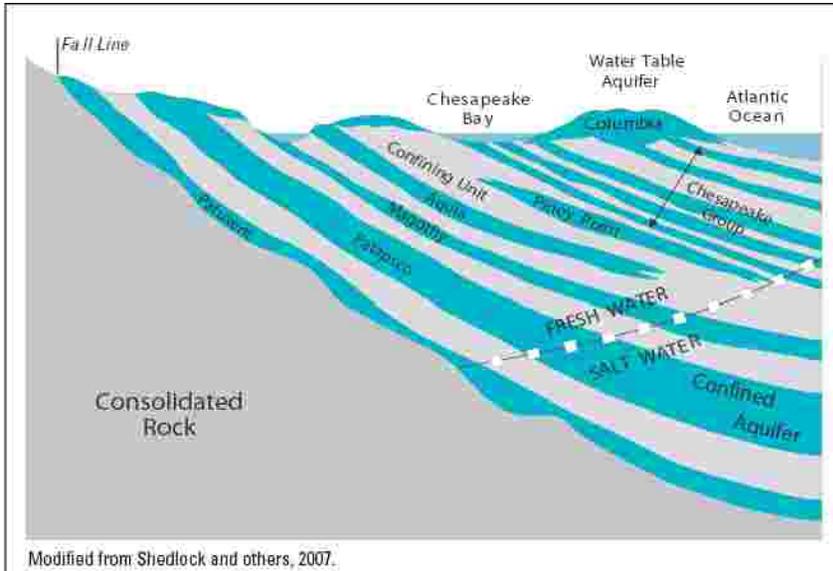
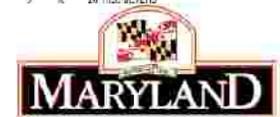
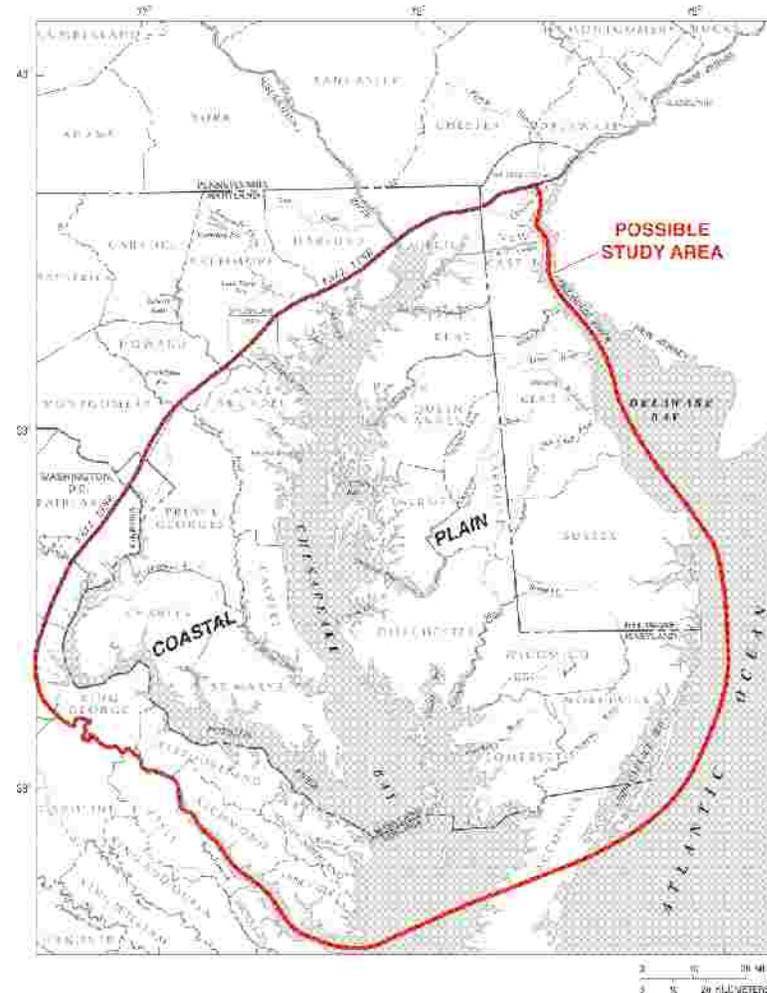


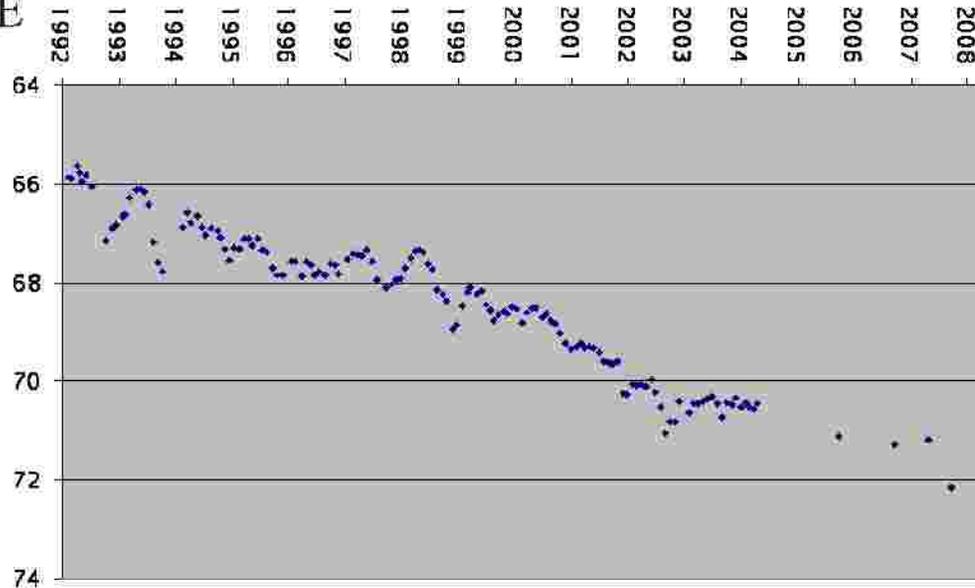
Figure 2. Maryland's major Coastal Plain aquifers.

Phase I of this study began in January 2006. If fully funded, the study is expected to be completed by 2013



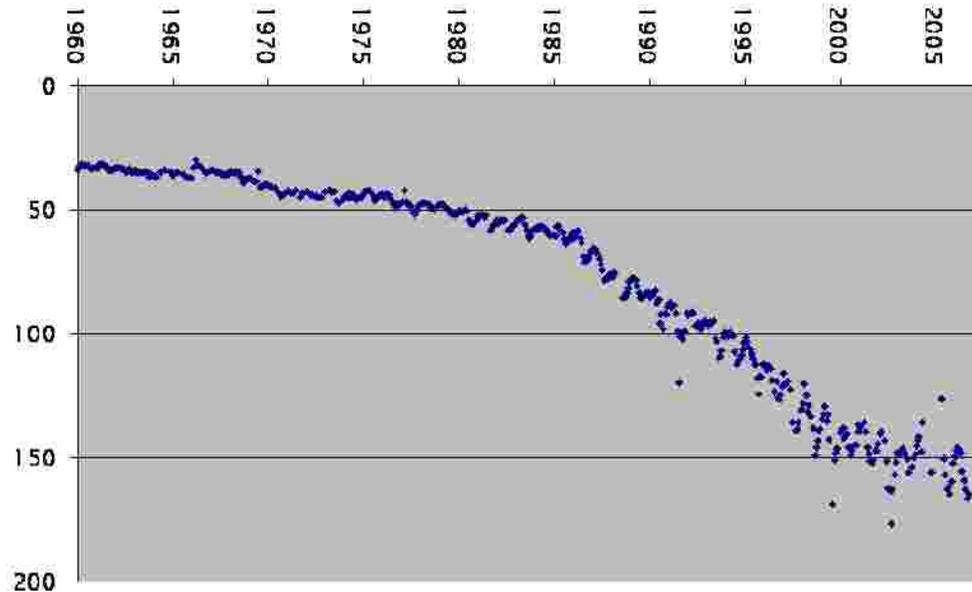


Kent - Patapsco



Many Aquifers in Southern Maryland and the Eastern Shore have shown steadily declining water levels

Calvert County - Aquia





What We Don't Know About the Coastal Plain

- What are the effects of withdrawals on the entire aquifer system?
- How much water can safely be withdrawn in areas where the aquifer is thin?
- How can we best evaluate alternative management scenarios?
- When and where will withdrawals impact stream flow or water quality?





Goals of Coastal Plain Study

- Aquifer Information System
 - Improve accuracy, availability and access to pertinent geologic and hydrologic data
- Ground Water Flow Model
 - Develop a digital flow model to improve ability to estimate sustainable amount of water that can be extracted
- Water Quality
 - Compile and enhance existing information





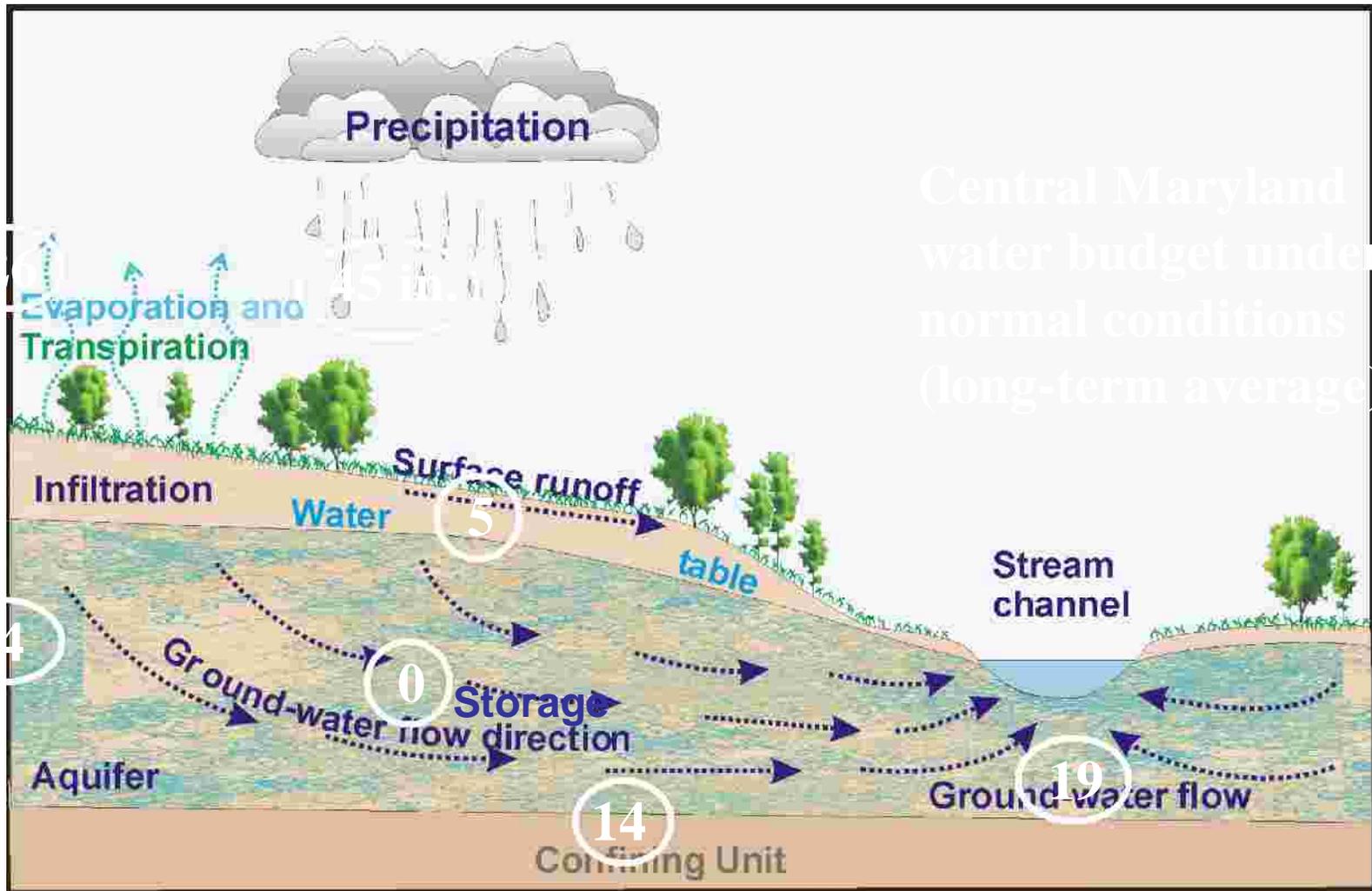
Goals of Coastal Plain Study

- Monitoring Networks
 - Fill in “gaps” in existing networks
- Tools for Improved Management
 - Computerized, GIS-based system with full access to pertinent information
 - Models for determining optimal patterns and rates of ground water withdrawals





Average Water Budget



Central Maryland water budget under normal conditions (long-term average)





What we don't know about Fractured Rock Aquifers

- What are the cumulative impacts of multiple withdrawals in a watershed?
- How do water withdrawals impact different kinds of aquatic biota? Are existing environmental flow requirements adequate?
- What are the impacts of withdrawals on headwater streams?
- How much ground water can actually be recovered? What factors affect well yields?
- How important are seasonal impacts?





Goals of Fractured Rock Study

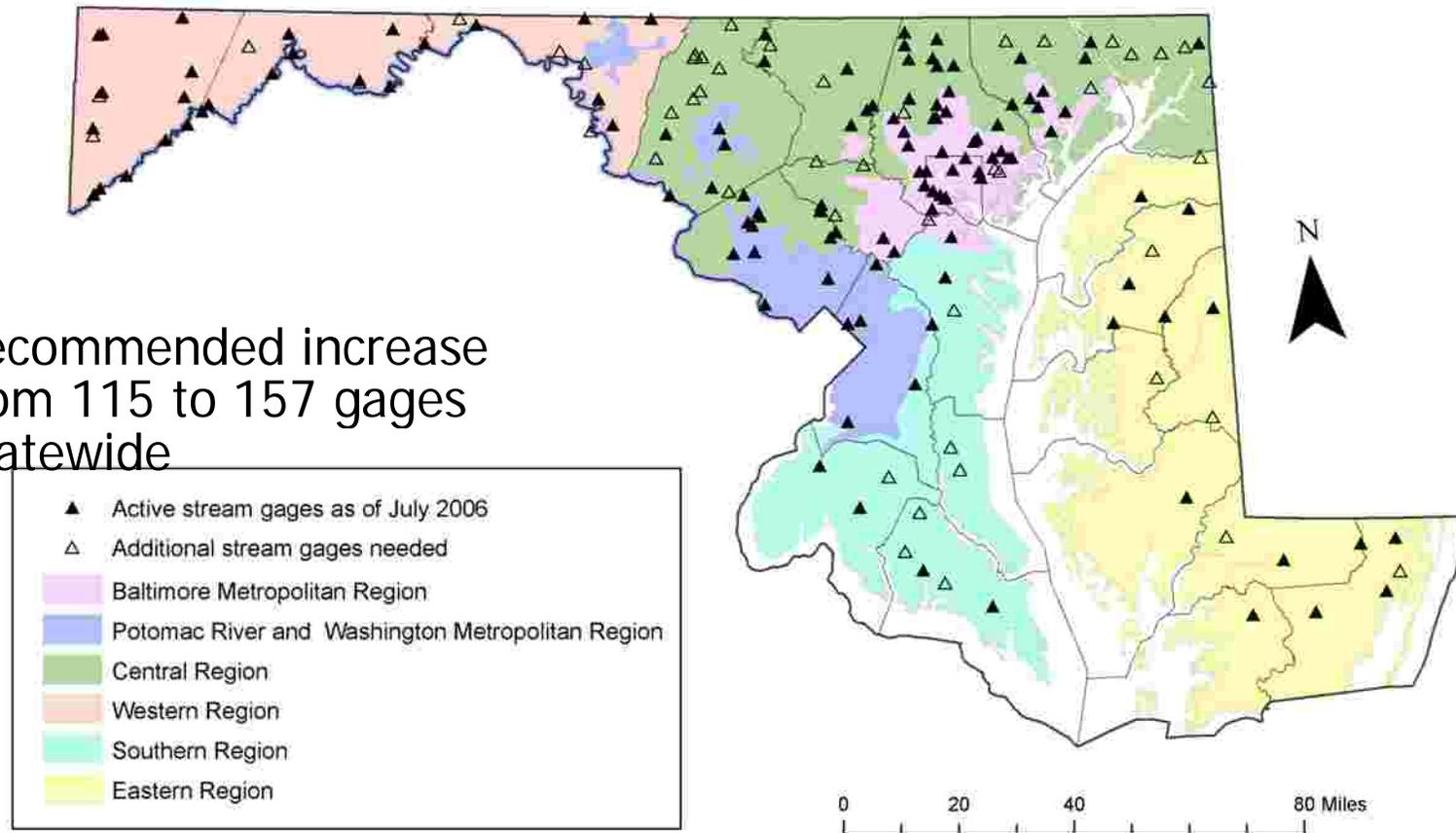
- Aquifer Information System
 - Similar to Coastal Plain project
- Regional software tool to estimate water availability
- Determine minimum flow requirements in various settings
- Determine factors affecting water availability





Maryland Stream Gage Network

Recommended increase
from 115 to 157 gages
Statewide



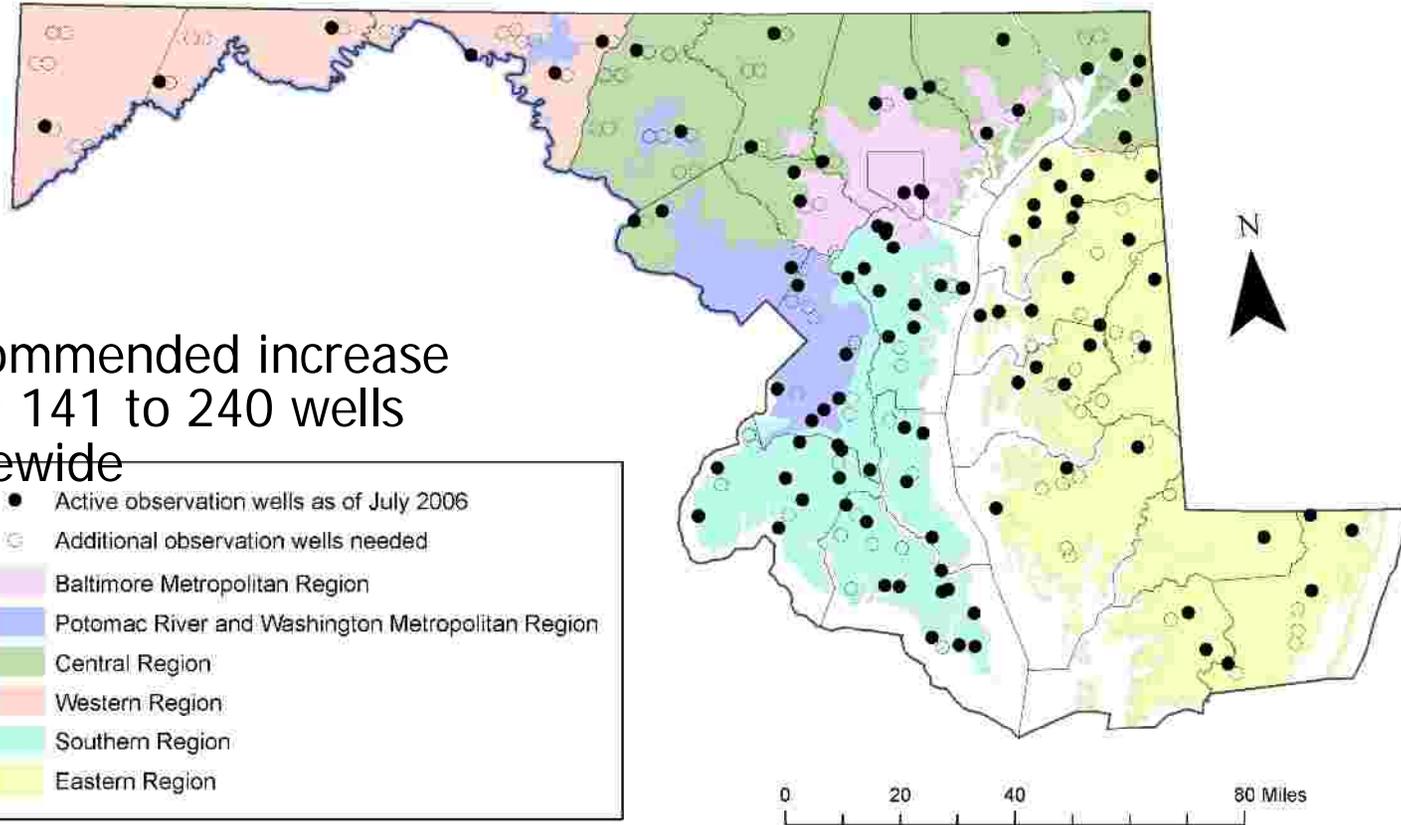
The accuracy of water supply assessments depends on the quality and distribution of available hydrologic monitoring data





Maryland Observation Well Network

Recommended increase
from 141 to 240 wells
Statewide



Wells and stream gages will be used to evaluate both water quantity and water quality





A Statewide Water Supply Plan Should be Developed





Statewide Plan to Ensure Sustainable Water Supplies

- Is there enough water in the right locations?
 - Water availability v. demand
- Is planned growth protective of water quality?





A Statewide Water Supply Plan

- Education and Outreach
- Conservation
- Water Quality
- Inter-basin Transfers
- Ecological Integrity
- Source Protection
- Allocation Policies
- Water Reuse





Regional Planning



- Cooperative
- By region, watershed, aquifer
- Focus on safeguarding supplies





Regional Planning

- Political boundaries are largely irrelevant to surface and ground water supplies
- Governments must overcome the preference for planning along jurisdictional lines





Key Findings

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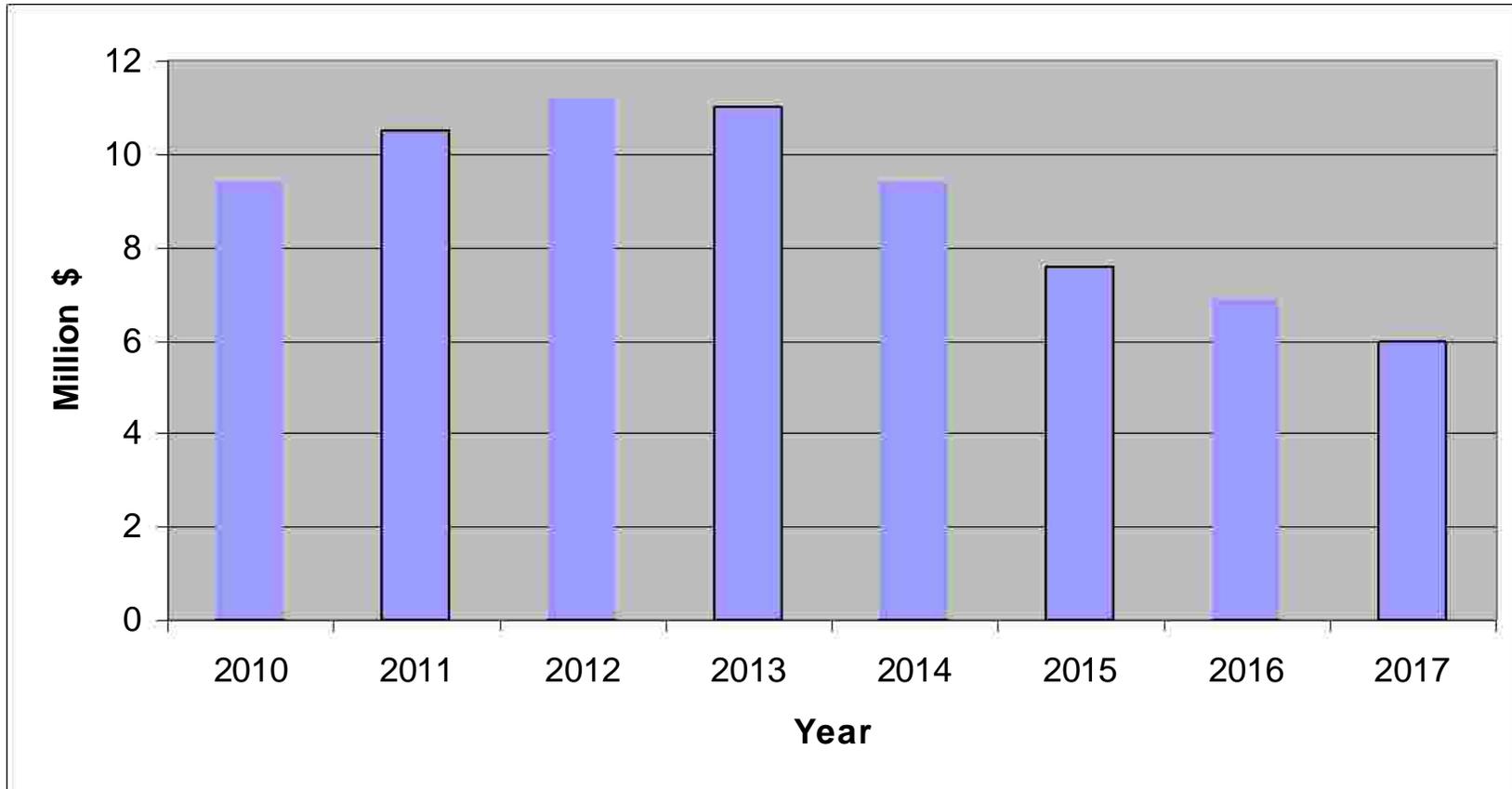
Programs Must Be Adequately and Reliably Funded

- Permit fee for water appropriations
- Funding for the two hydrologic studies
- Funding for the expanded monitoring network
- Assistance to local governments





Funding Required to Implement Committee's Recommendations



Total Cost of Committee Recommendations is about \$72 million





Estimated Cost of Water Supply Projects

Coastal Plain Project

\$ 11,775,000 over 8 years

Fractured Rock Project

\$ 5,712,000 over 5 years

Surface and Ground Water Monitoring

\$ 9,047,000 over 8 years





Key Findings

- I. Maryland must develop a more robust water resources program based on sound, comprehensive data.
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Protect Citizens Who Rely on Individual Wells

- Additional testing
- Periodic retesting
- Outreach
- A workgroup has been formed to study this issue





Discourage The Use of Individual Wells in Areas at High Risk for Contamination

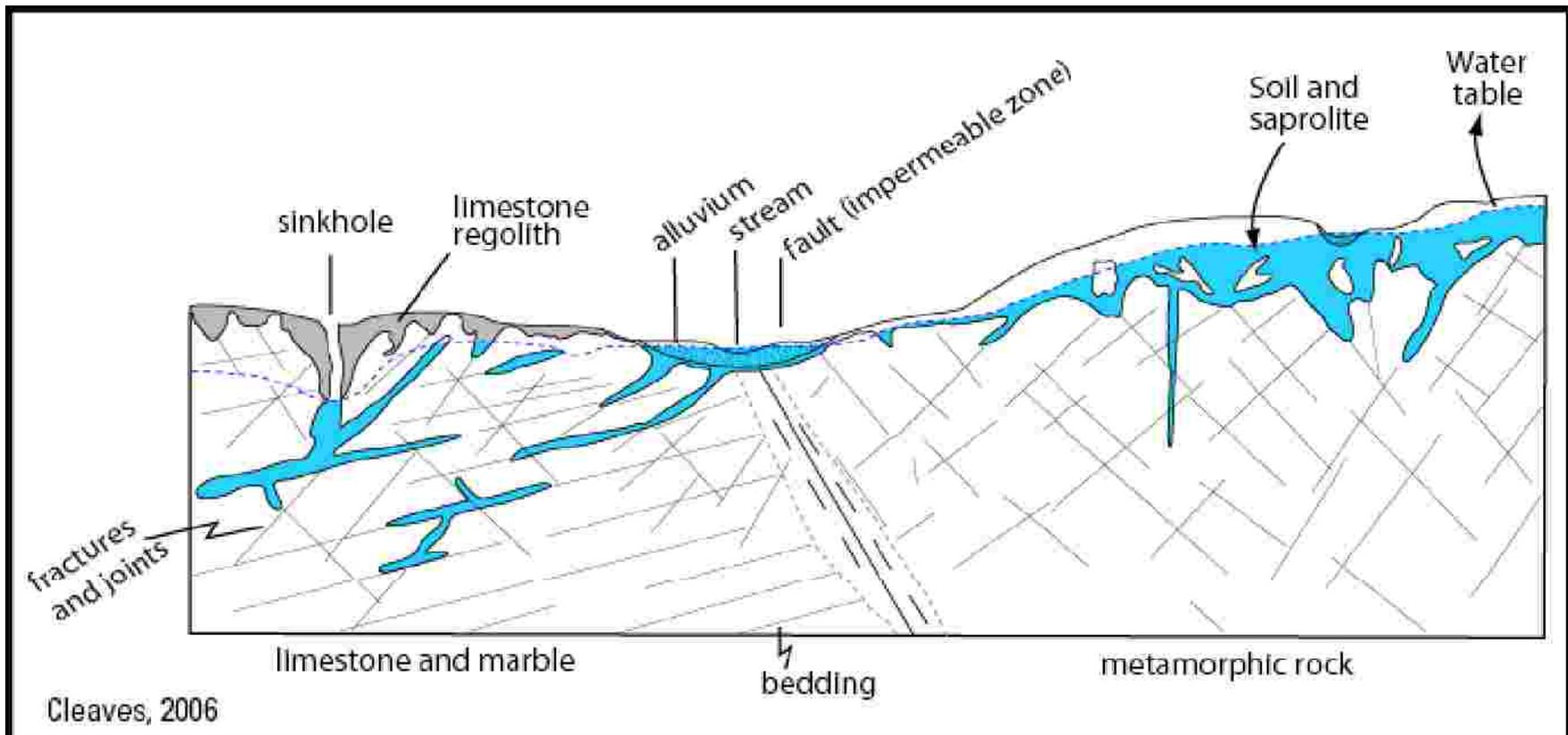


Figure 3 . Cross-section showing hydrogeologic framework in the Piedmont of Maryland.



Strengthen Programs

- Water conservation
- Water reuse
- Demand management





Demand Management

- Demand management programs can result in water use reductions of 10 – 30%
- Most economically beneficial where water supplies are stressed
- Most appropriate for water suppliers to implement





What Can We Do?

- Encourage local governments to evaluate the potential for reducing demand with their Water Resource Elements
- Develop regulatory requirements/ guidance for demand management and water reuse
- Increase public awareness





Outreach



- Water supply challenges are likely to become more frequent and intense
- A well informed public is essential
- Individual choices matter
- Political will matters





All Advisory Committee Reports are available on MDE's website under NEW PUBLICATIONS – more publications

www.mde.state.md.us





“The cumulative effect of the choices each individual makes will determine the success of the water management program”

