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

- Irrigation (3.5%)
- Aquaculture (1.6%)
- Livestock (0.9%)
- Mining (0.7%)
- Thermoelectric (31.8%)
- Industrial (5.5%)
- Domestic (6.5%)
- Commercial (1.7%)
- Public Supply (47.7%)

MGD
Maryland’s population is expected to increase by 1.4 million by 2030
• Public supply, domestic wells, aquaculture and irrigation uses are increasing.

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

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

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.

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

(* Not projected)
Agricultural Water Use is Expected to Increase

Irrigation Use by Month in Maryland's Coastal Plain

- Surface Water
- Ground Water

Million gallons per day

Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec

0 | 50 | 100 | 150 | 200 | 250 |
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

Phase I of this study began in January 2006. If fully funded, the study is expected to be completed by 2013.
Many Aquifers in Southern Maryland and the Eastern Shore have shown steadily declining water levels.
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
Fractured Rock Water Supply Study

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

- Active observation wells as of July 2006
- Additional observation wells needed

- Baltimore Metropolitan Region
- Potomac River and Washington Metropolitan Region
- Central Region
- Western Region
- Southern Region
- Eastern Region

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

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.
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

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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”