Virginia's Water Quantity Management

State Water Commission, 12 January 2009

Quality – Quantity Relationship

- Key concept: both are beneficial uses of available flow or supply
- Water quality beneficial uses include waste or pollution assimilation, fish and wildlife habitat
- Water quantity beneficial uses include water withdrawals for human activities, navigation, and recreation
- These uses sometimes compete for the same gallon
- As available supply decreases the potential for conflict increases

VA Water Quantity Mgmt Tools

- Manage water withdrawals and use through regulatory programs:
  - Virginia Water Protection Program,
  - Ground Water Management Act of 1992,
  - Local and Regional Water Supply Planning Program
  - Water Use Reporting Program
- Other tools like:
  - Potomac Low Flow Allocation Agreement

Water Quantity History in VA

Water Resources Management Milestone[1]	Drought Event
1966 – Comprehensive water policy and planning authority enacted 1971 – New Constitution adopted with natural resources/ environmental provisions 1972 – Water supply and water quality programs consolidated; Natural Resources Secretariat created 1973 – Virginia Groundwater Act of 1973 enacted	1962 - 1971
1977 – State Water (Study) Commission created	
1980s – Water supply river basin plans developed	1980 - 1982
1990s – Increased focus on water quality planning and management/decreased water supply focus	
2003-2007 – Water supply planning and permitting authority changes	1999 - 2002
2008 – Water re-use regulation	

[1] Adapted from Cox, William. Environment Virginia Presentation. 2003.

Water Planning pre-2003

- “Every one for themselves” planning
- “Water has always been there” planning
- “Won’t be a drought worse than the 1930s drought” planning
- Started to plan when water use reached 80% of permitted capacity (VDH)
- Extended drought from 1999-2002 exposed some inadequacies in planning

Activity Since 1999-2002 Drought

- the Local and Regional Water Supply Planning Regulation (2005),
- amendments to the VWPP Regulation (2007),
- legislation addressing consumptive use in the Potomac (2007),
- a Water Reuse Regulation (2008), and
- development of a State Water Resources Plan (~2012).
- New effort looking at Ground Water Program.

Water Supply Planning Regulation

- State Water Commission initiative
- SB1221- enacted by the General Assembly in 2003 - required DEQ to develop criteria for local and regional planning and a preliminary state water resources plan.
- State Water Control Board adopted final regulation June 28, 2005.
- All counties, cities and towns will submit a plan to the board, individually or as part of a region.

Water Supply Planning Regulation

DEQ Vision

Achieve the full economic and environmental potential of Virginia's water resources through sustainable water supply planning to meet current and future beneficial uses of water.

Water Supply Planning Regulation

How are we going to accomplish this vision?

- Promote the interdependence of water users so cooperative regional planning and optimization of common water resources can be achieved; and
- Create a water planning partnership among state, local, regional interests and the public through a comprehensive and continuous planning process for the wise use of our water resources.

Required Elements

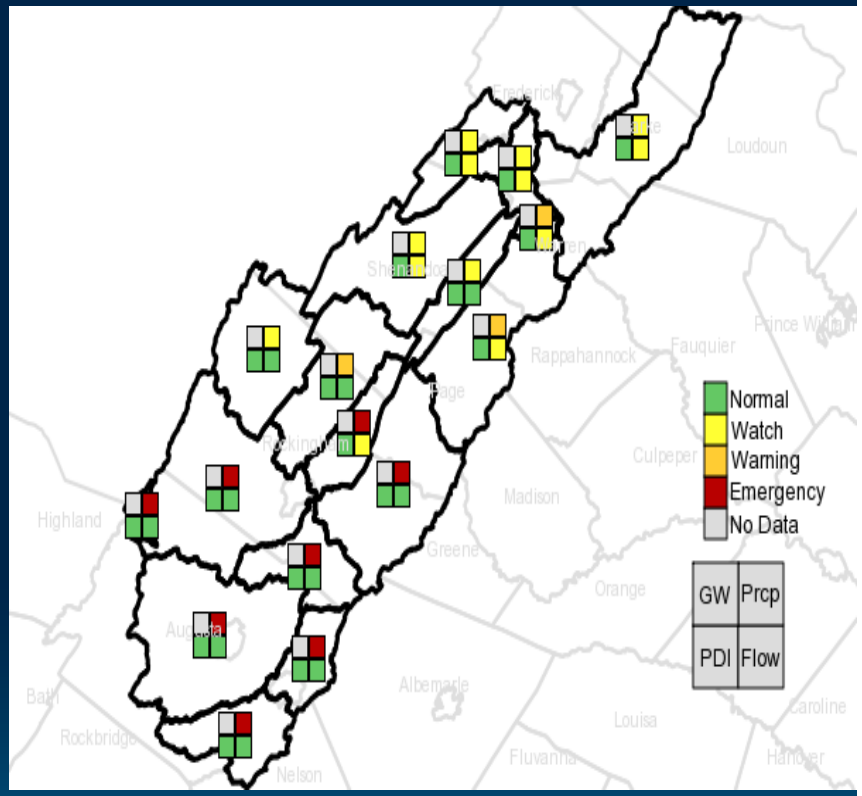
- A description of existing water sources;
- A description of existing water use;
- An assessment of projected water demand;
- A statement of future need;
- An analysis that identifies potential alternatives to address projected deficits in supplies;
- A description of existing water resource conditions;
- A description of water demand management actions;
- A drought contingency and response plan.

2008 Emphasis on Drought Response

- Governor's Water Conservation and Drought Forum
- DEQ staff assistance priority
- Create "Drought Ready Communities"
- Bring down to local scale: develop local triggers appropriate to address local water sources and water use mix
- Integrate into state-wide real time web application to monitor local drought conditions

New Drought Assessment Tool

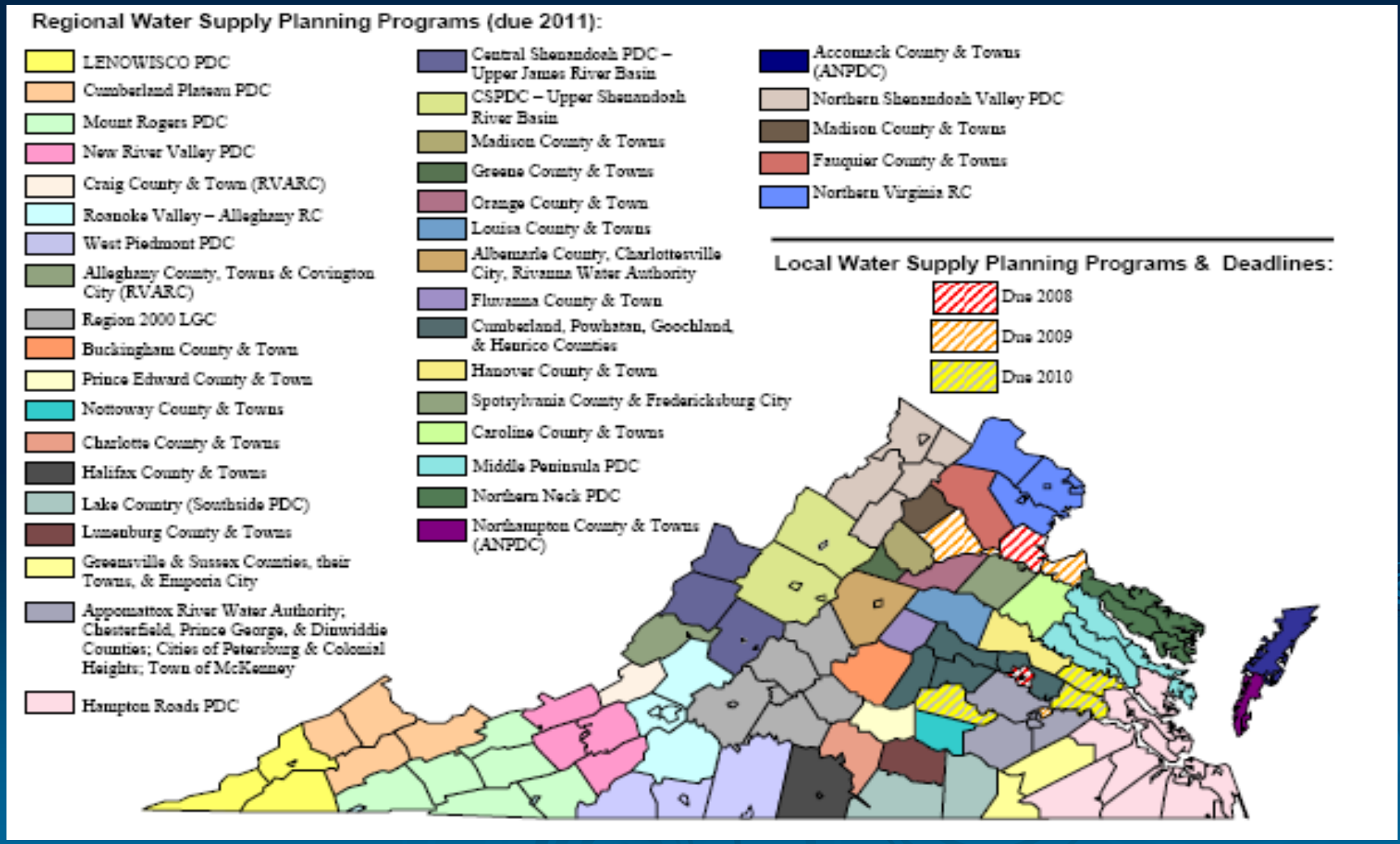
- Based on Virginia Drought Assessment and Response Plan
- Includes deviation from normal values for:
  - Precipitation
  - Streamflow
  - Ground water level (where available)
  - PDSI or Reservoir level (where available)
- Color coded graphs and tables are updated daily with near real-time data
- Charts and data are summarized by GIS shape files, based on watershed, sub-watershed, political, or planning boundaries as desired



Important Dates

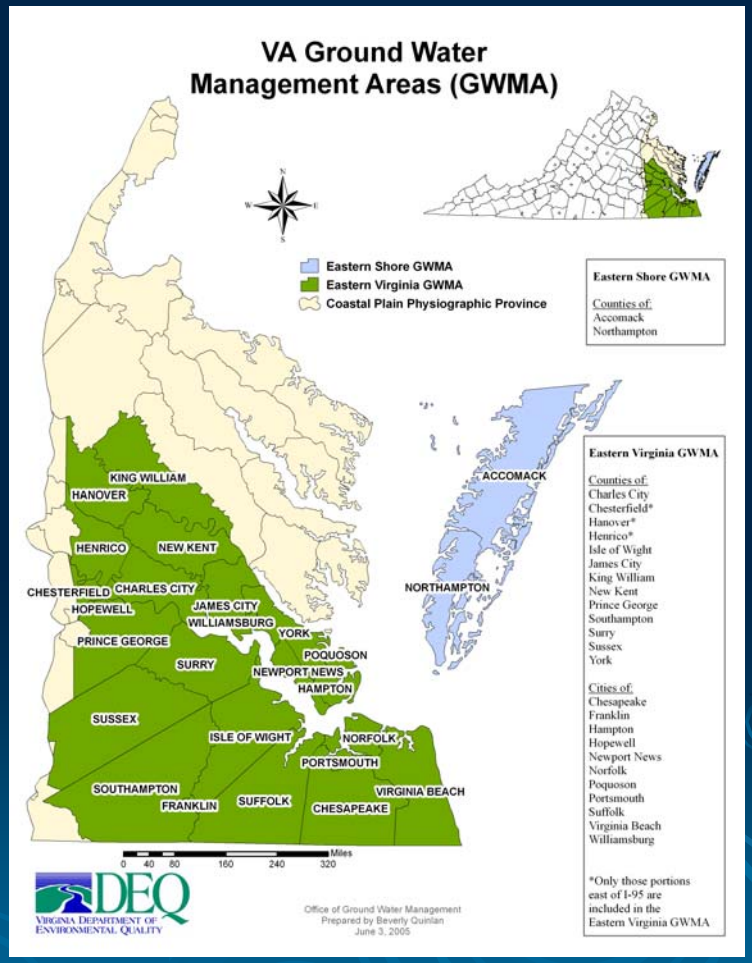
- Population-based deadlines
  - Greater than 35,000 = November 2, 2008
  - 15,000 to 35,000 = November 2, 2009
  - Less than 15,000 = November 2, 2010
  - Regional with LOI = November 2, 2011
- Letter of Intent (LOI) to regionalize due by November 2, 2008
- Localities to review their plans every five years to assess adequacy. Updates required every 10 years.

Current State-wide Progress of Localities



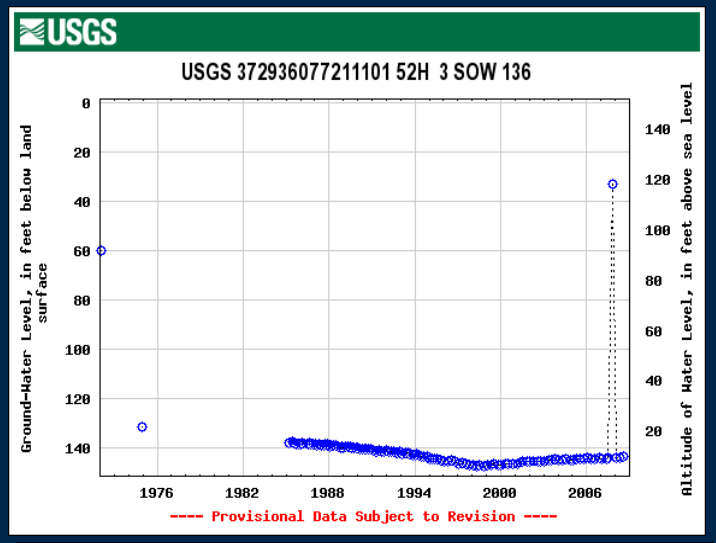
GW Management Areas

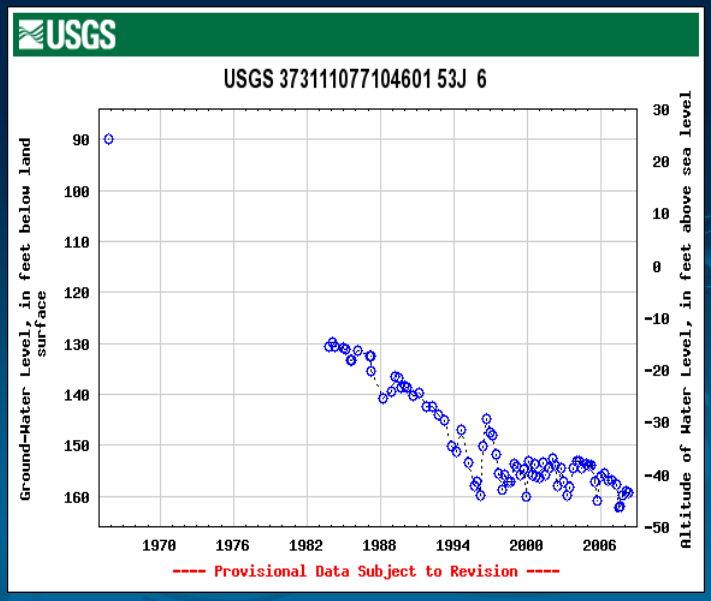
- Covers about 2/3 of the Coastal Plain
- Regulates an estimated 57% of withdrawals >300,000 gpm in CP
- Does not include most single family wells



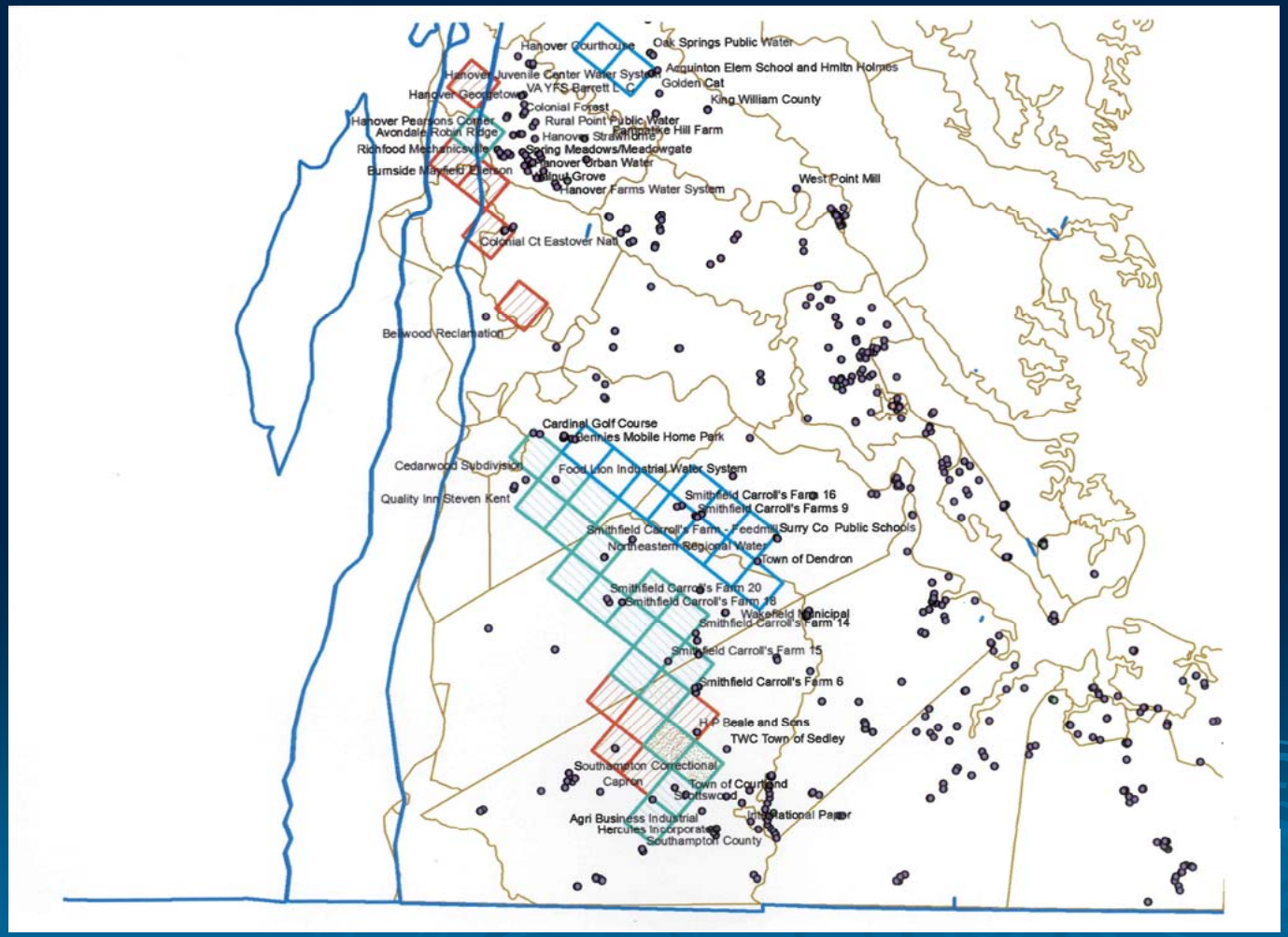
GW Availability Problem Areas

- Ground water has been drawn down significantly in parts of the Coastal Plain.
- Places along the fall line are declining more rapidly than other areas.
- Field data is showing water levels are lower that model predictions in these areas.





Location of Problem Areas



Citizens on Ground Water

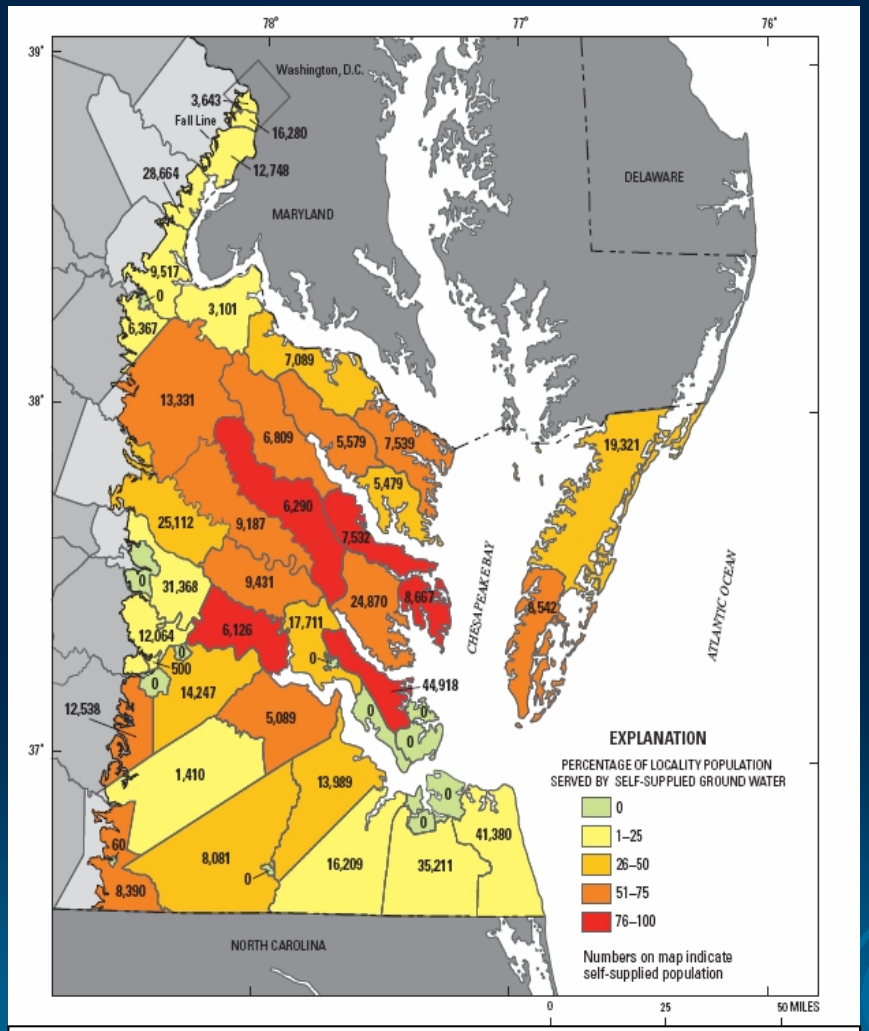
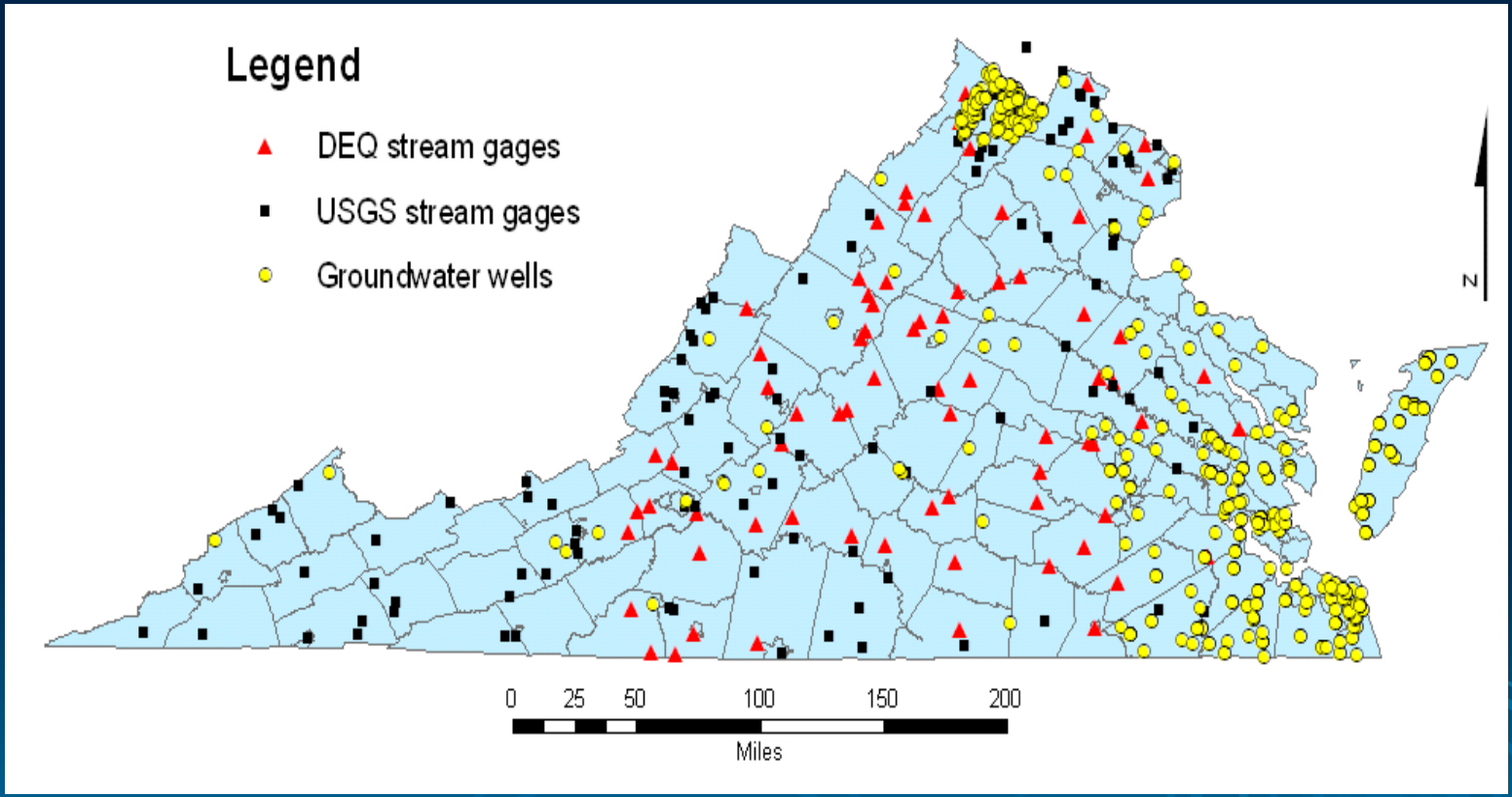
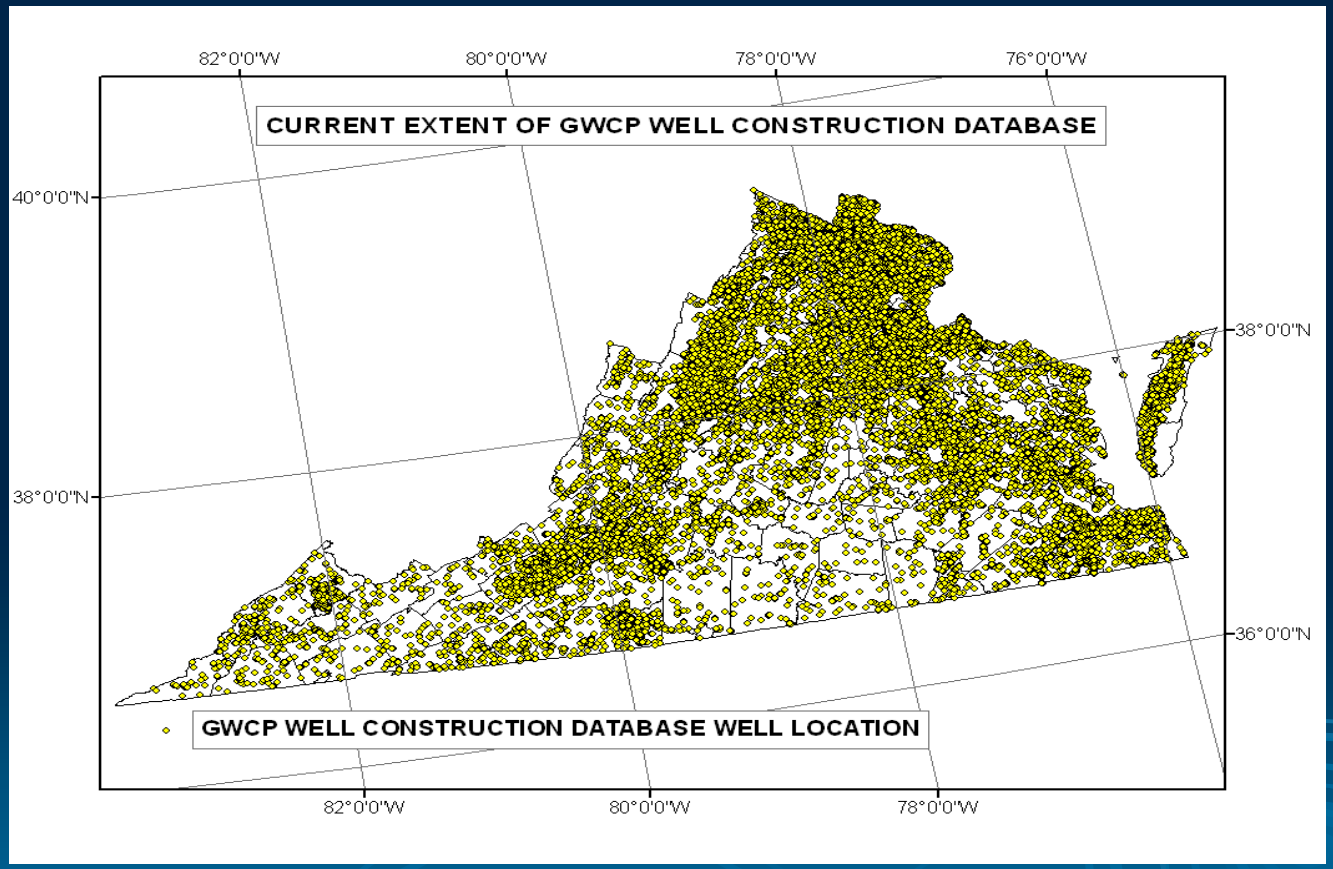


Figure Populations and percentages of populations in Virginia Coastal Plain localities served by self-supplied ground water in 2000 (from Pope, USGS SIR 2007-5250)

Current Monitoring Network



Well Construction Database

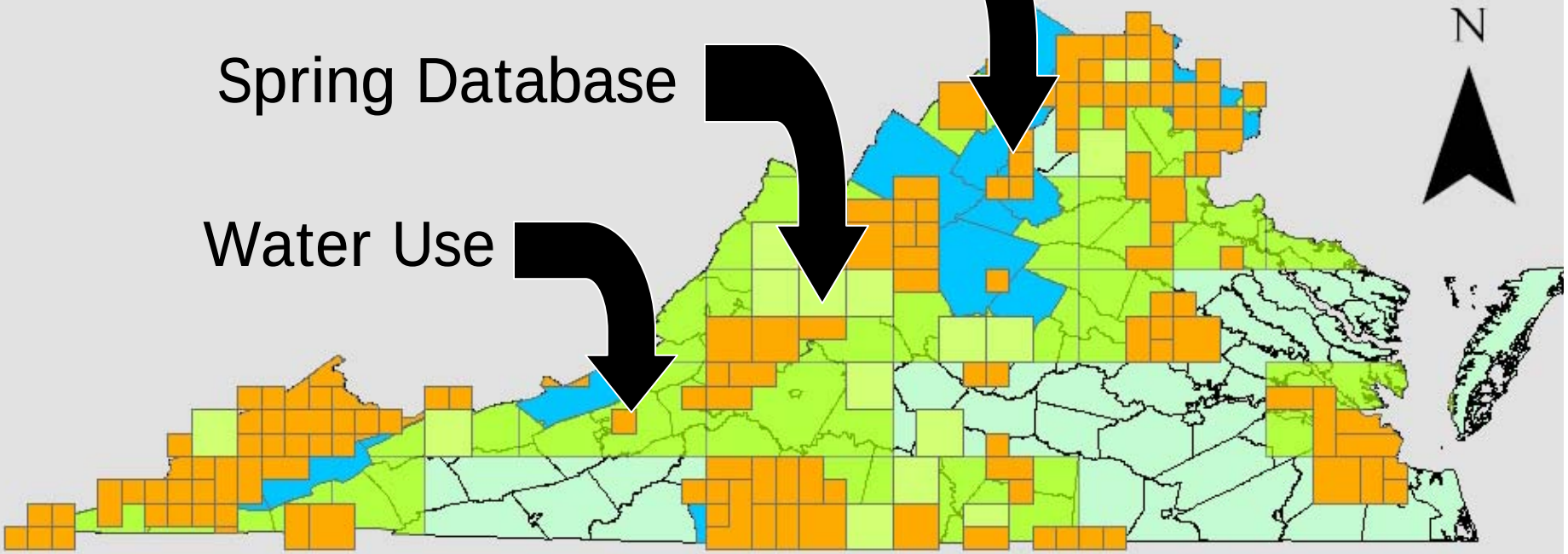


Geologic Mapping available from VGDMR and USGS 2008

Well Database

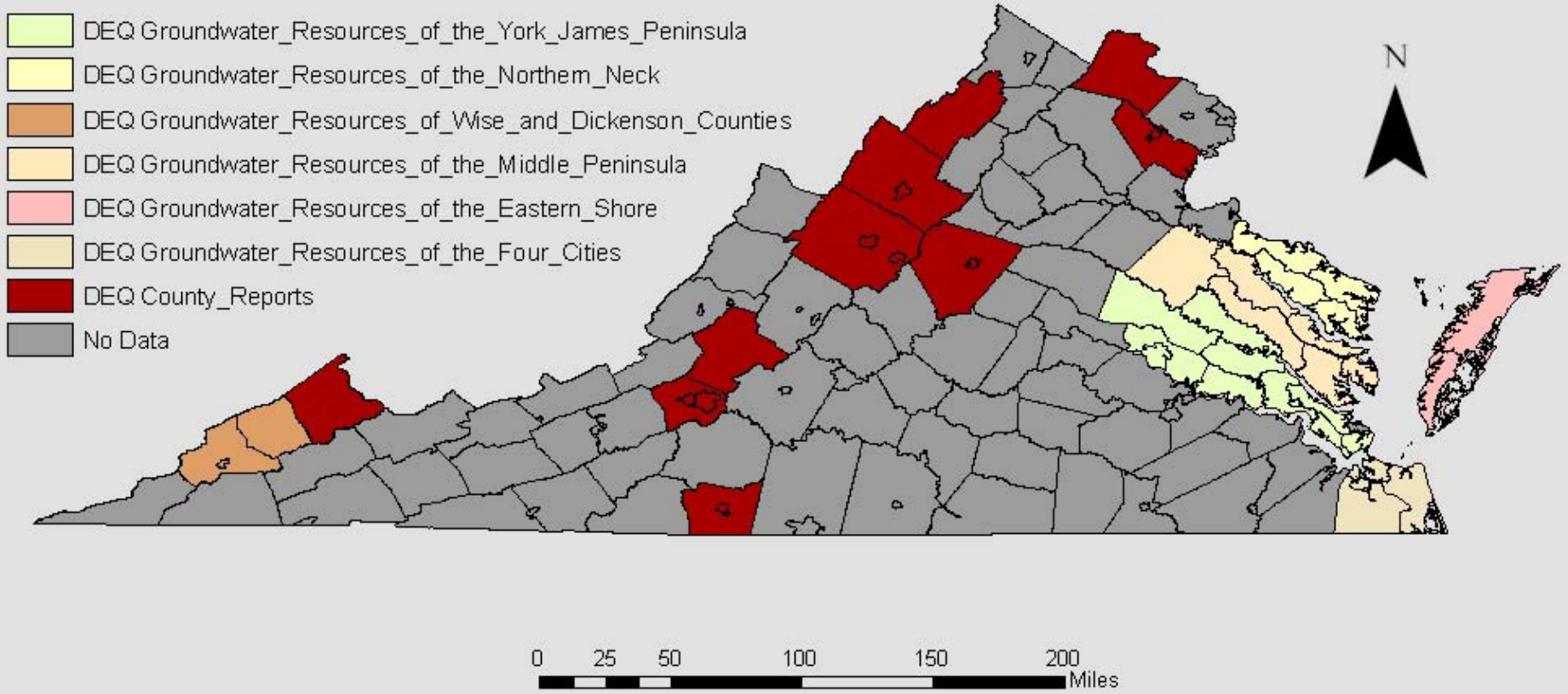
Spring Database

Water Use

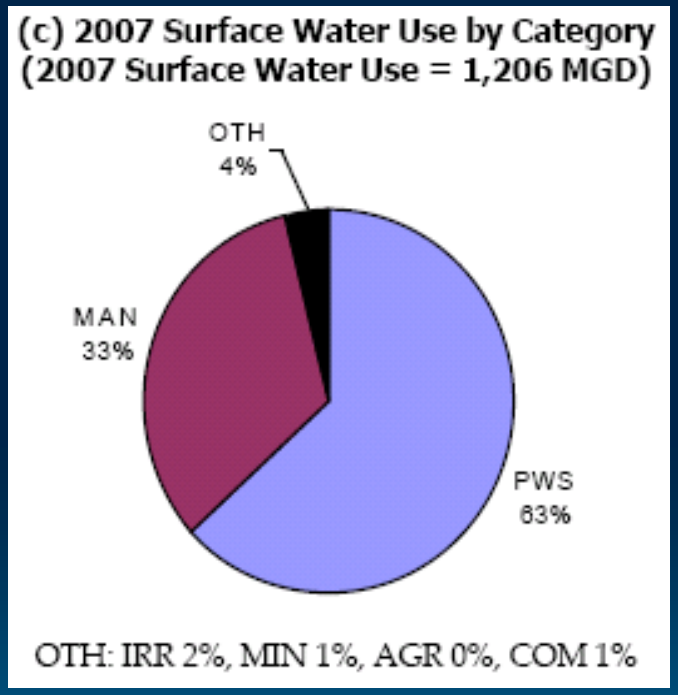


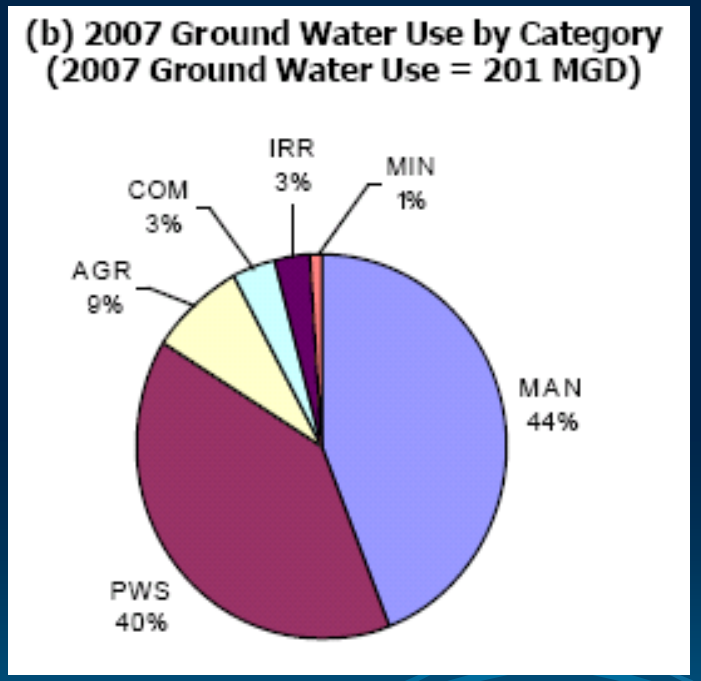
= Hydrologic Mapping

Available Publications about Ground Water Conditions in Virginia Sparse

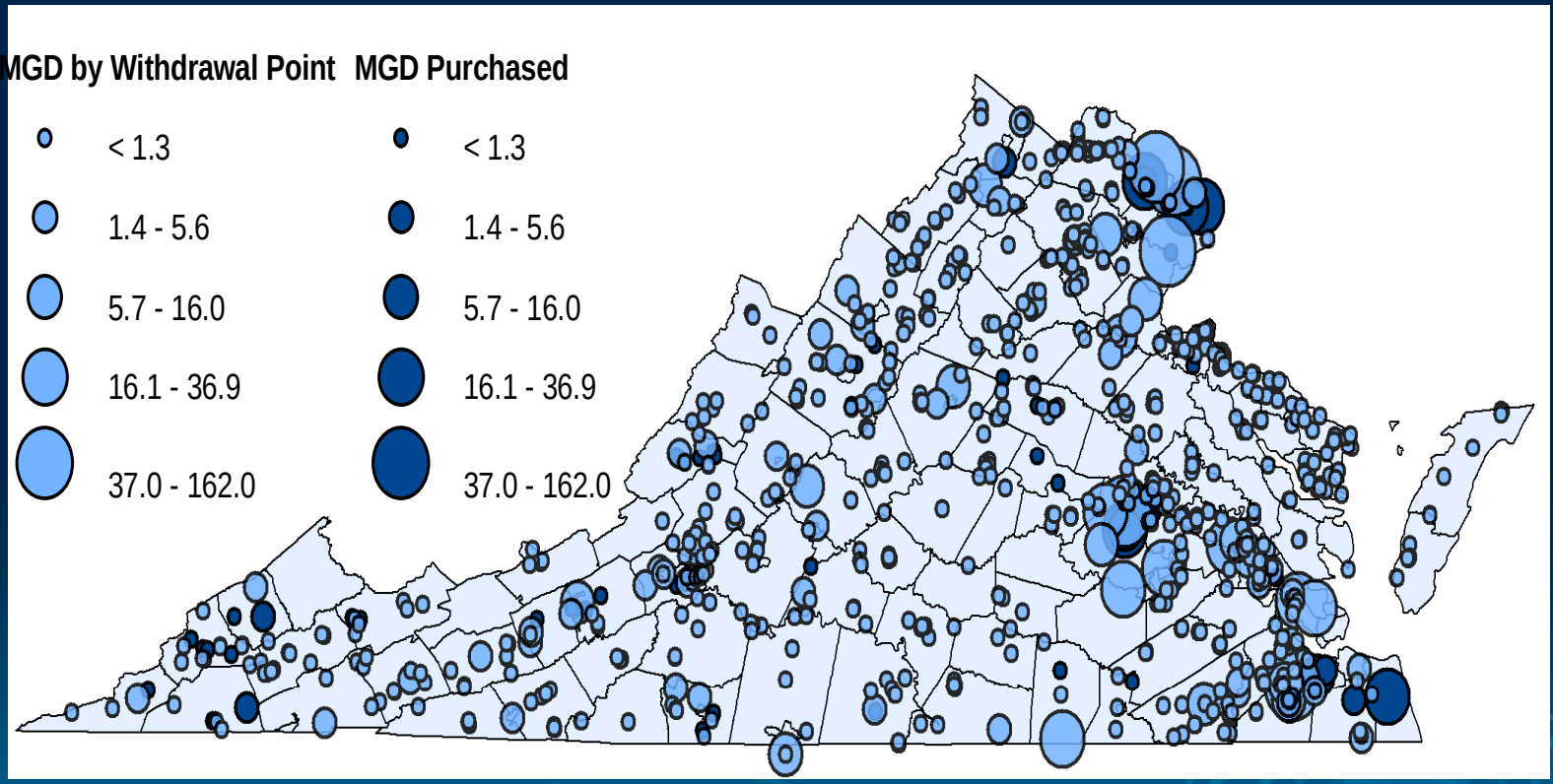


2007 Water Use

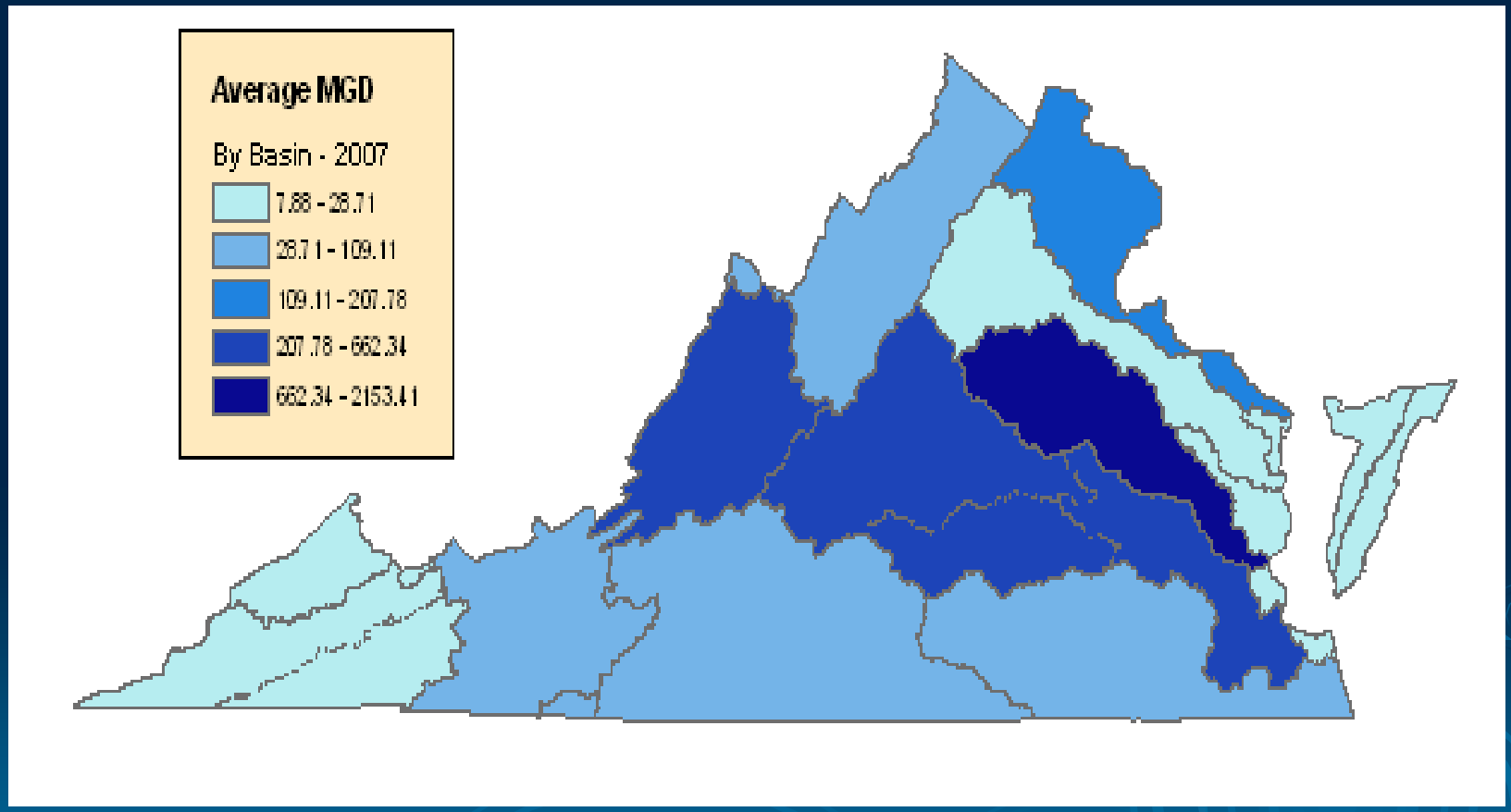




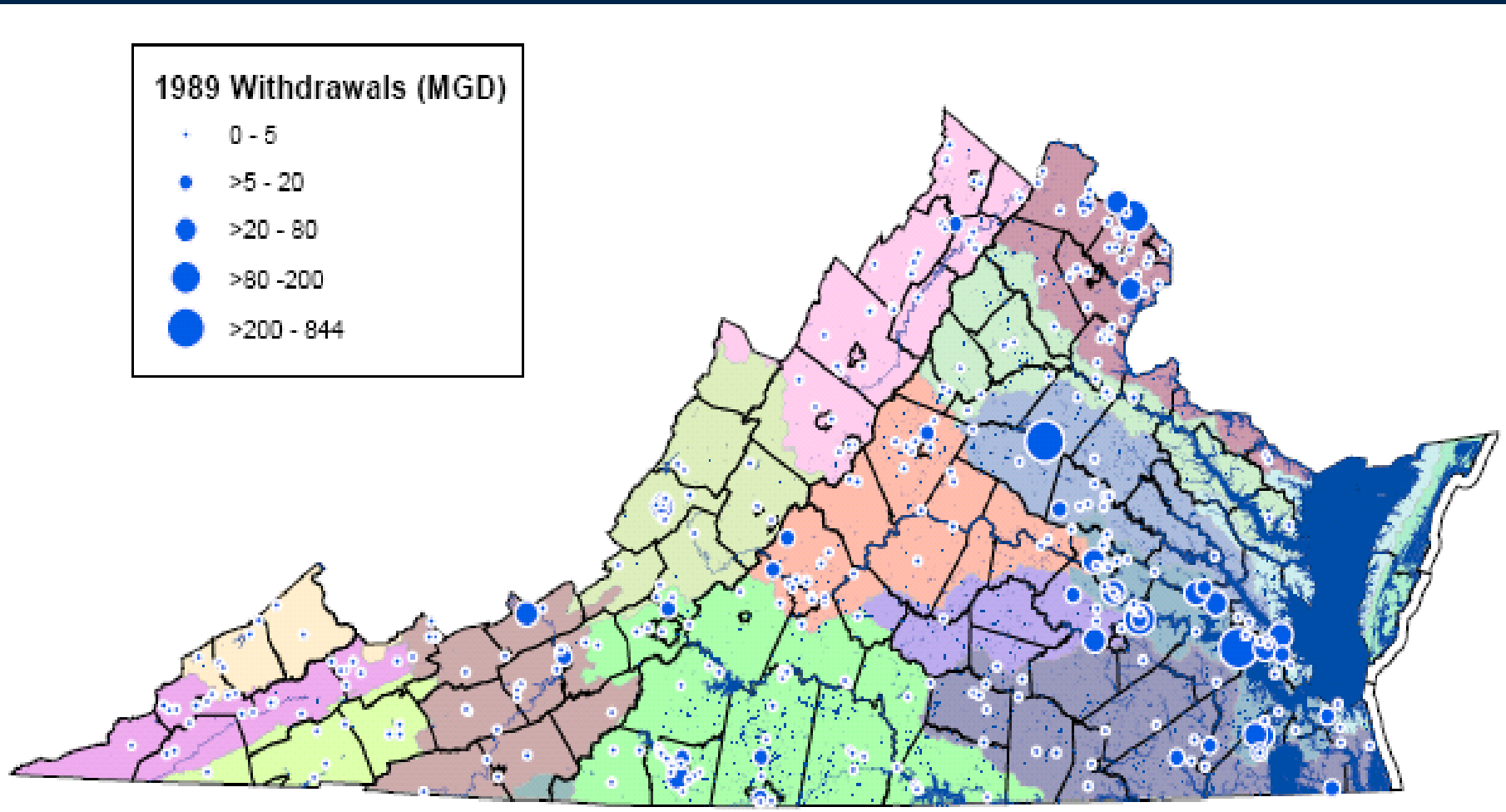
2007 Public Water Supply Water Withdrawals and Purchases



Basins with the Most Water Use



Users Excluded From VWP



What's Next?

- 62.1-44:38 …evaluate, to the extent practicable, the ability of subsurface and surface waters to meet current and future water uses, including minimum instream flows…
- 9 VAC 25-780-140.G says we need to, among other actions, conduct "[a] cumulative demand analysis" and an "evaluation of potential use conflicts among projected water demand and estimates of requirements for in-stream flow."
- How do we meet human needs while maximizing the remainder for other statutorily protected beneficial uses (fish and wildlife habitat, recreation, navigation, assimilative capacity)?

Important New Data/Tools

From WSPs:

1. Amounts withdrawn from various water sources;
2. Amounts of water used for different purposes;
3. Amount of expected new water demand in the planning period;
4. Potential alternative sources and expected amounts of water to address projected deficits.

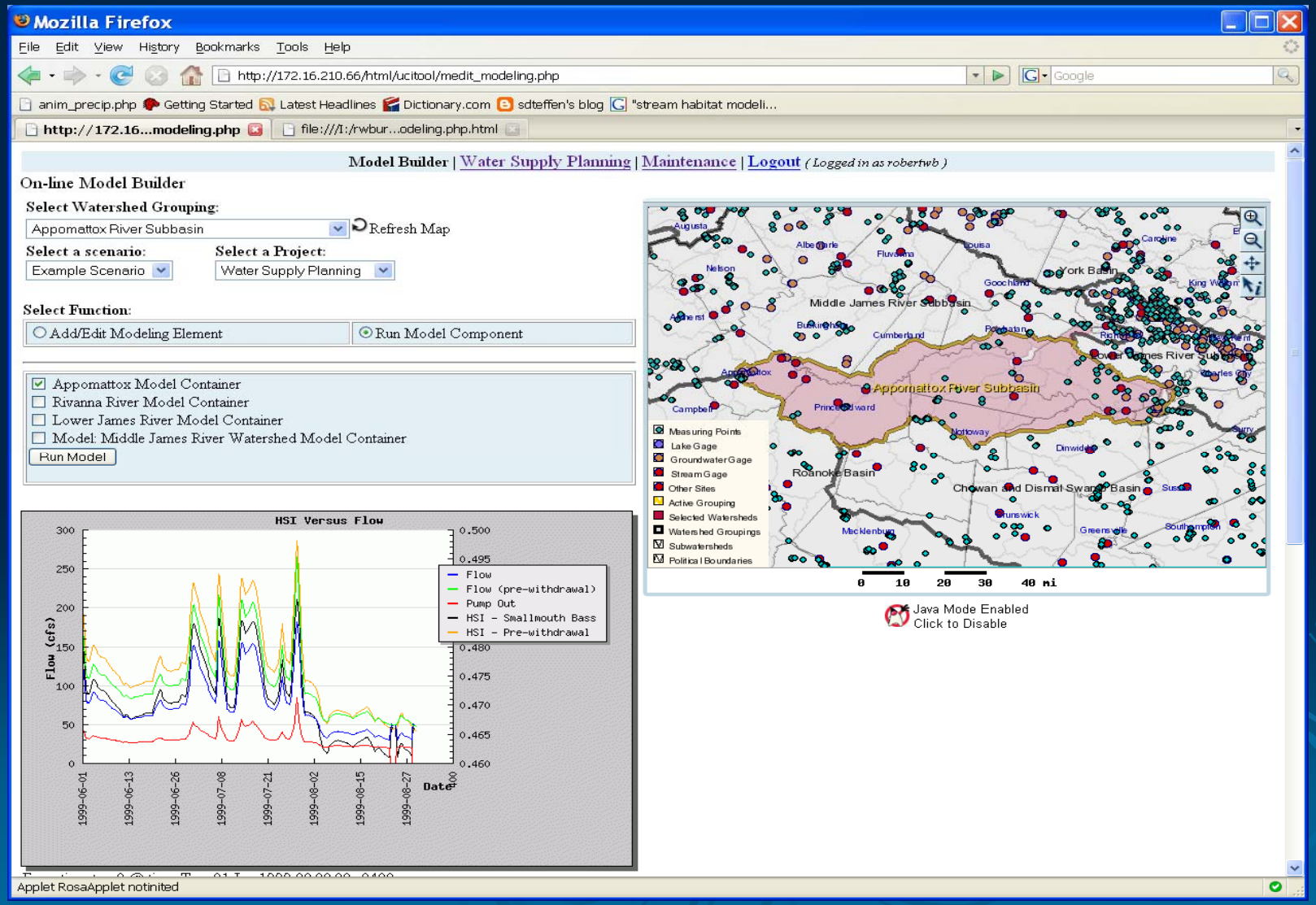
From new VWP requirements:

1. Maximum withdrawal capacity of grandfathered intakes.

From USGS Projects:

1. Ungaged watershed flow statistics
2. River basin model

Decision Support System



Financial and Staff Resources

- Collecting GW/Geologic data, managing databases, and developing County GW Reports = 4
- Collecting SW data, keeping gages maintained = 7
- Assisting localities with water supply planning = 5
- Water use data, SW/GW modeling = 4
- WSP Planning Aid to Localities: FY06 = $300,000; FY07 = $500,000; FY08 = $300,000; FY09 = $200,000; FY10 = $100,000 ?
- SW/GW Monitoring = $500,000

Future Challenges and Opportunities

- Water resource data needs.
- Water reuse/desal opportunities need to become mainstream alternatives.
- Climate change is mostly about impacts to water.
- Population growth continues in areas without sufficient water resources.
- Current system promotes inequity.

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http://www.deq.virginia.gov/watersupplyplanning/homepage.html

2003-2007 Public Water Supply Water Use with Population Growth