Virginia Coastal Plain Groundwater Issues

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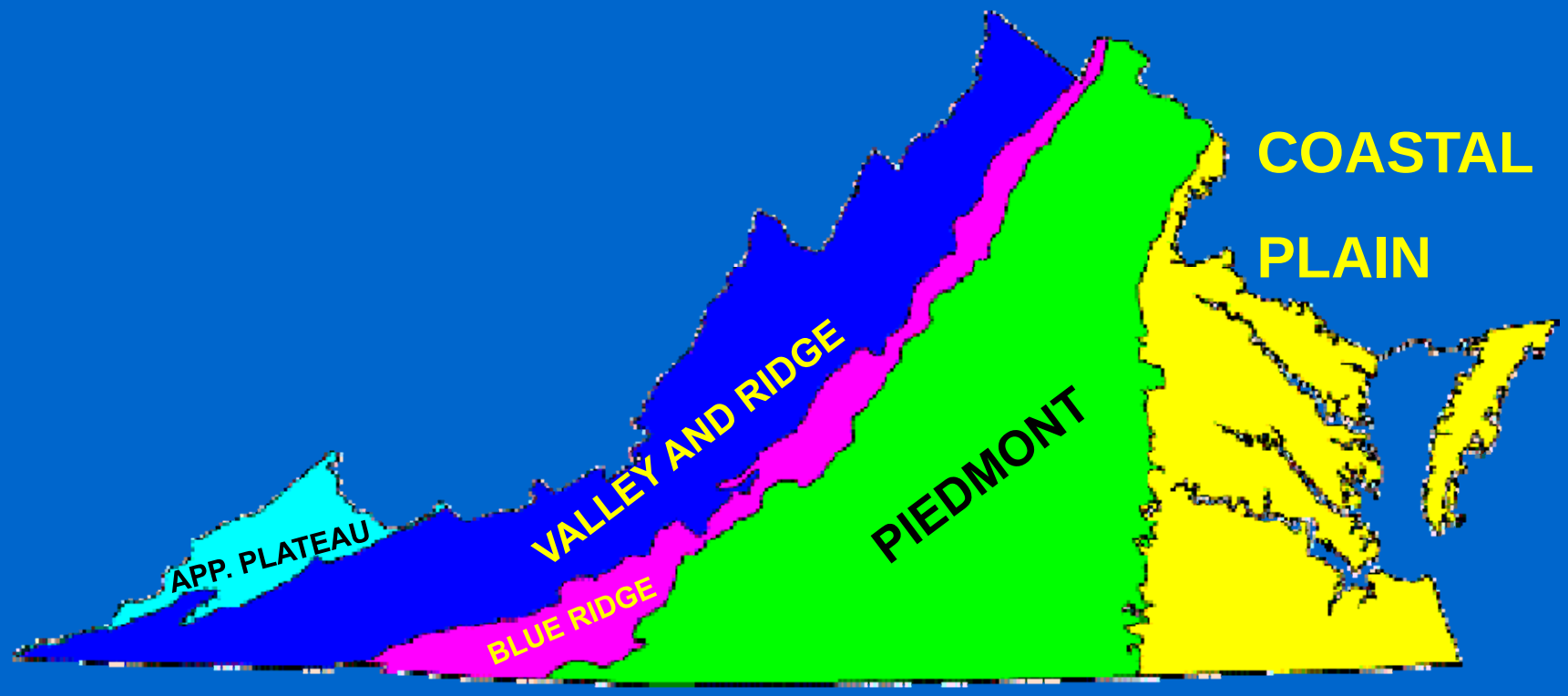
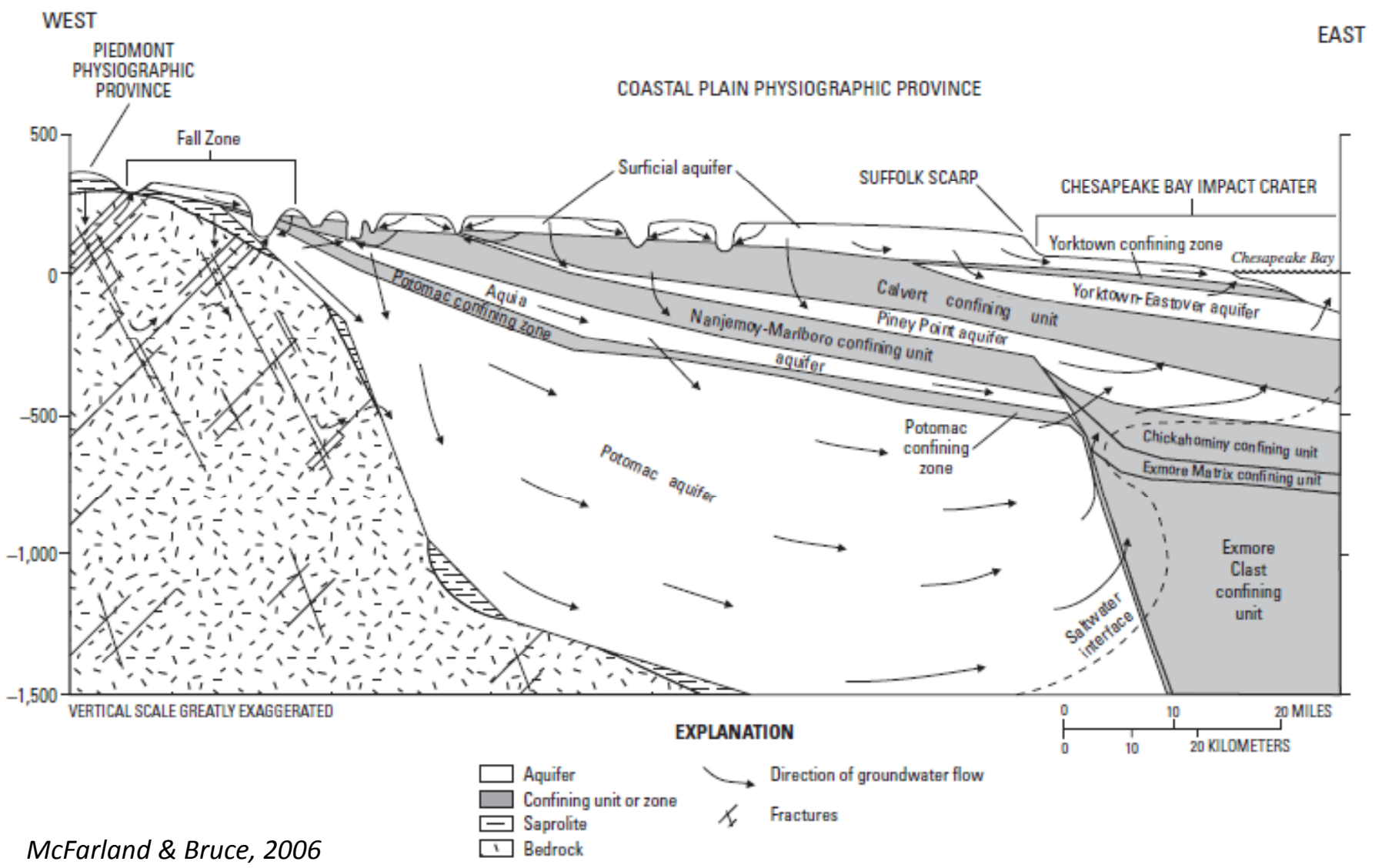
Director, Office of Water Supply

VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY

Virginia Physiographic Provinces



VA Coastal Plain Aquifer Cross-Section

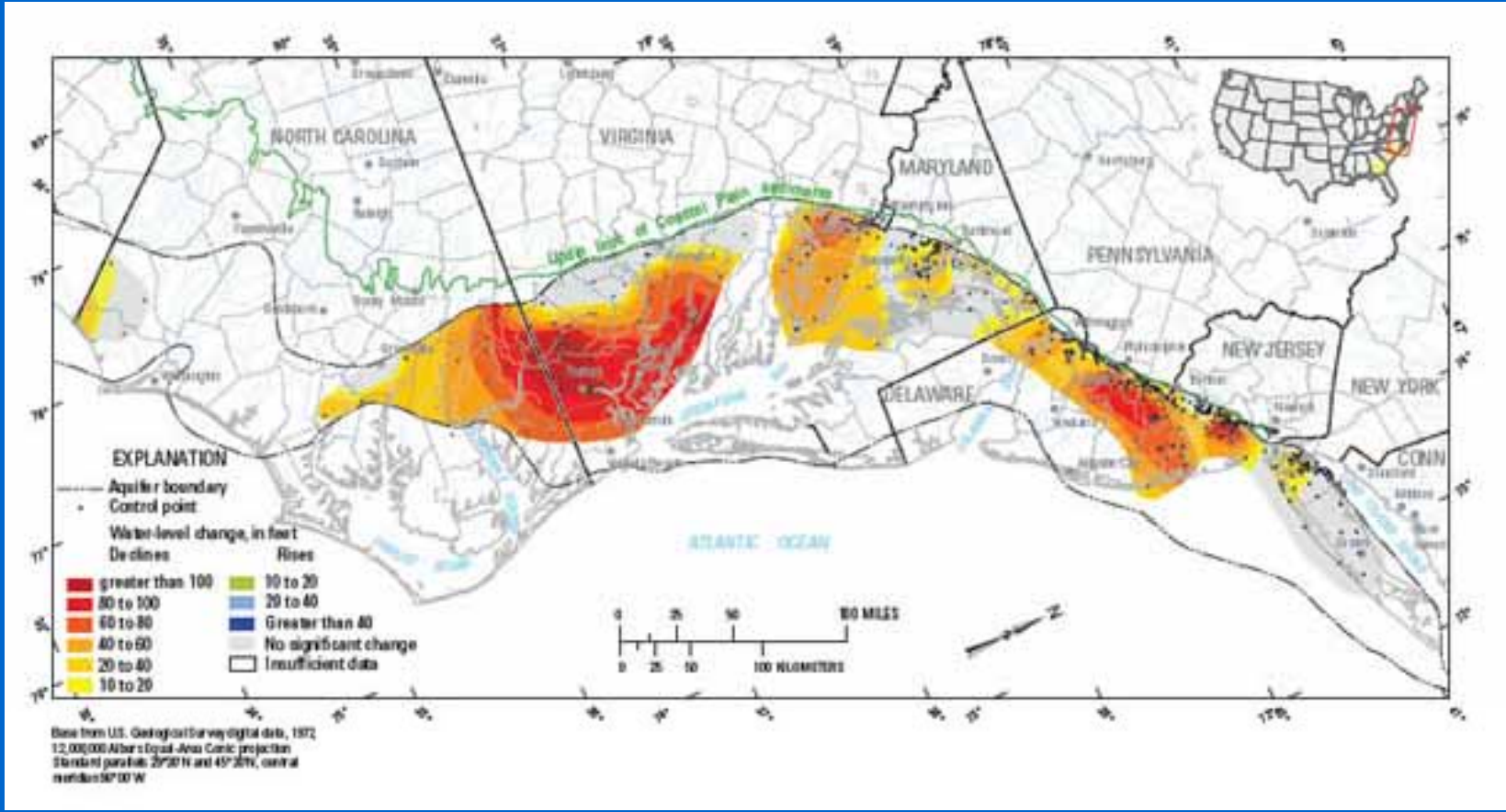


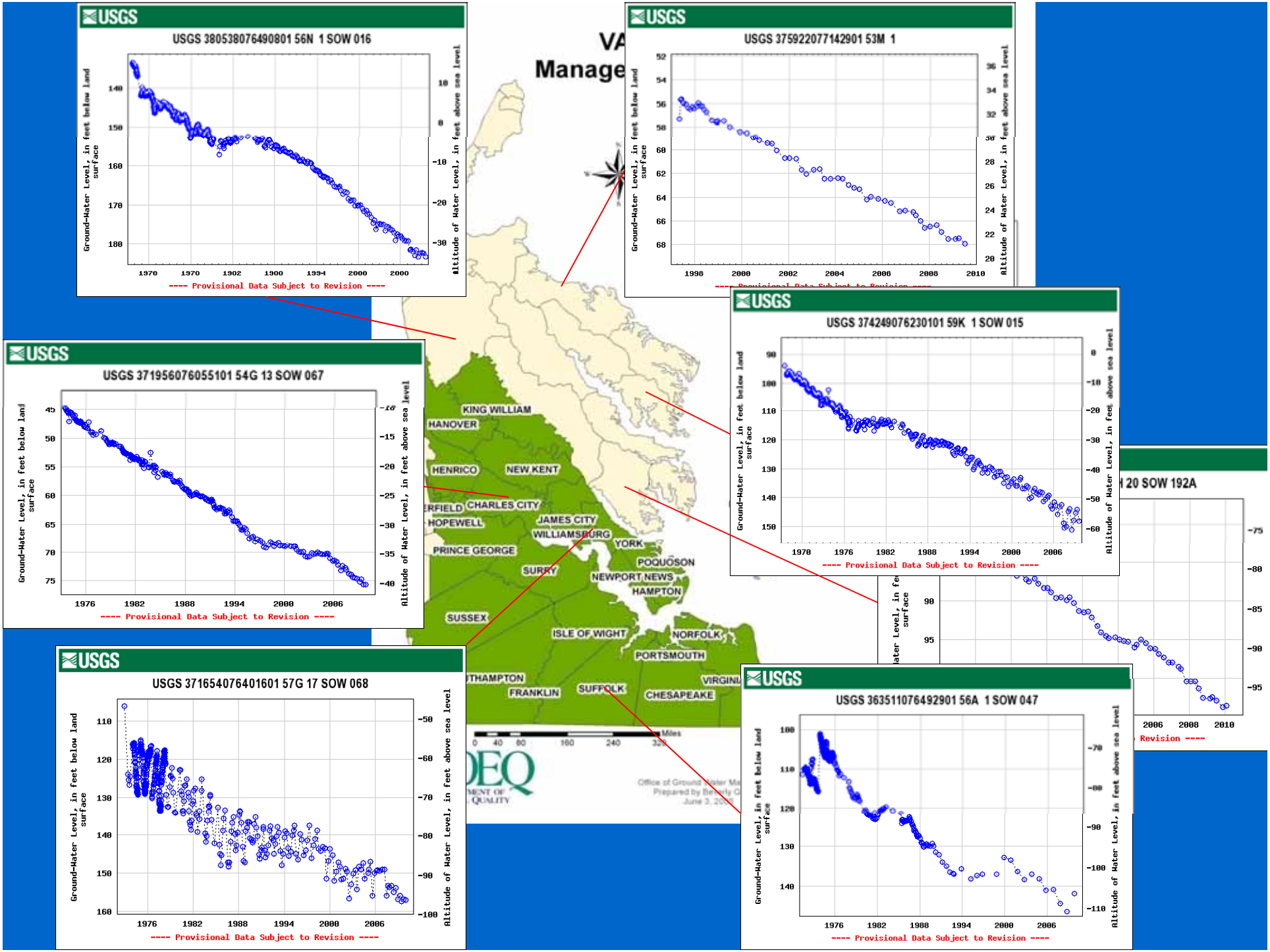
McFarland & Bruce, 2006

Management Issues

- Reversal of the hydraulic gradient (groundwater flow) leads to salt water intrusion
- Declining water levels
- Subsidence and loss of storage

Largest Water Level Declines in Mid-Atlantic




USGS
USGS 380538076490801 56N 1 SOW 016
Ground-Water Level, in feet below Land surface
Altitude of Water Level, in feet above sea Level
---- Provisional Data Subject to Revision ----
USGS
USGS 375922077142901 53M 1
Ground-Water Level, in feet below Land surface
Altitude of Water Level, in feet above sea Level
USGS
USGS 371956076055101 54G 13 SOW 067
Ground-Water Level, in feet below land surface
Altitude of Water Level, in feet above sea level
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Altitude of Water Level, in feet above sea level
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Altitude of Water Level, in feet above sea level
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Altitude of Water Level, in feet above sea level
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KING WILLIAM
HANOVER
HENRICO
NEW KENT
CHARLES CITY
JAMES CITY
WILLIAMSBURG
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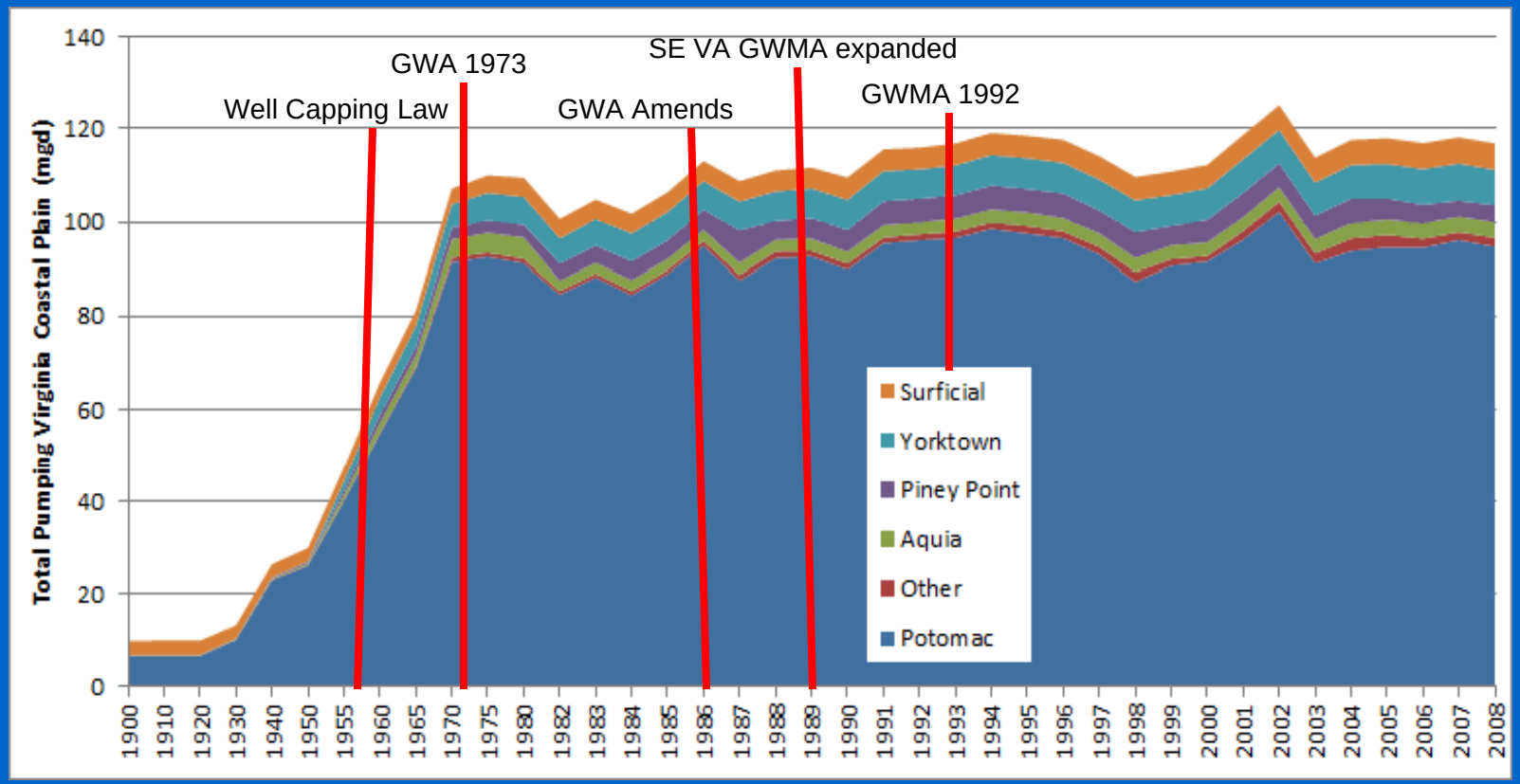
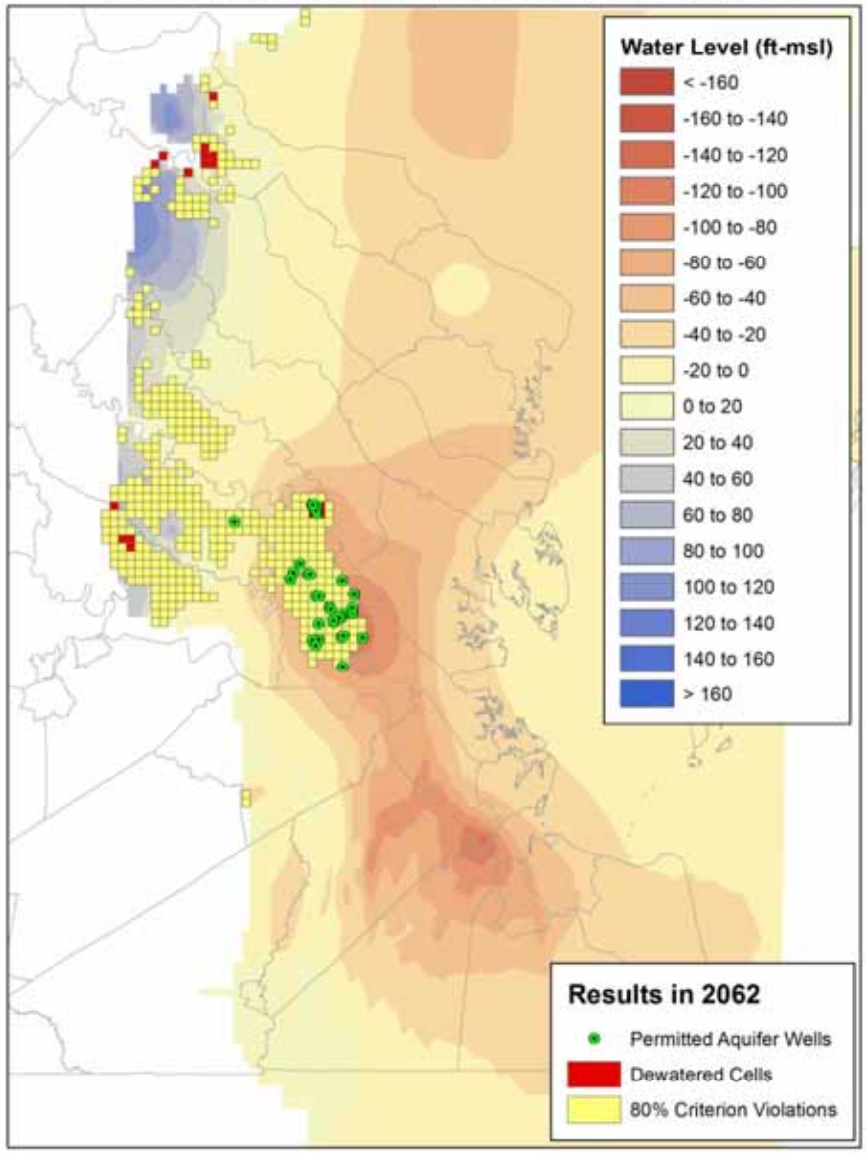
SUSSEX
ISLE OF WIGHT
NORFOLK
PORTSMOUTH
FRANKLIN
SUFFOLK
CHESAPEAKE
Miles

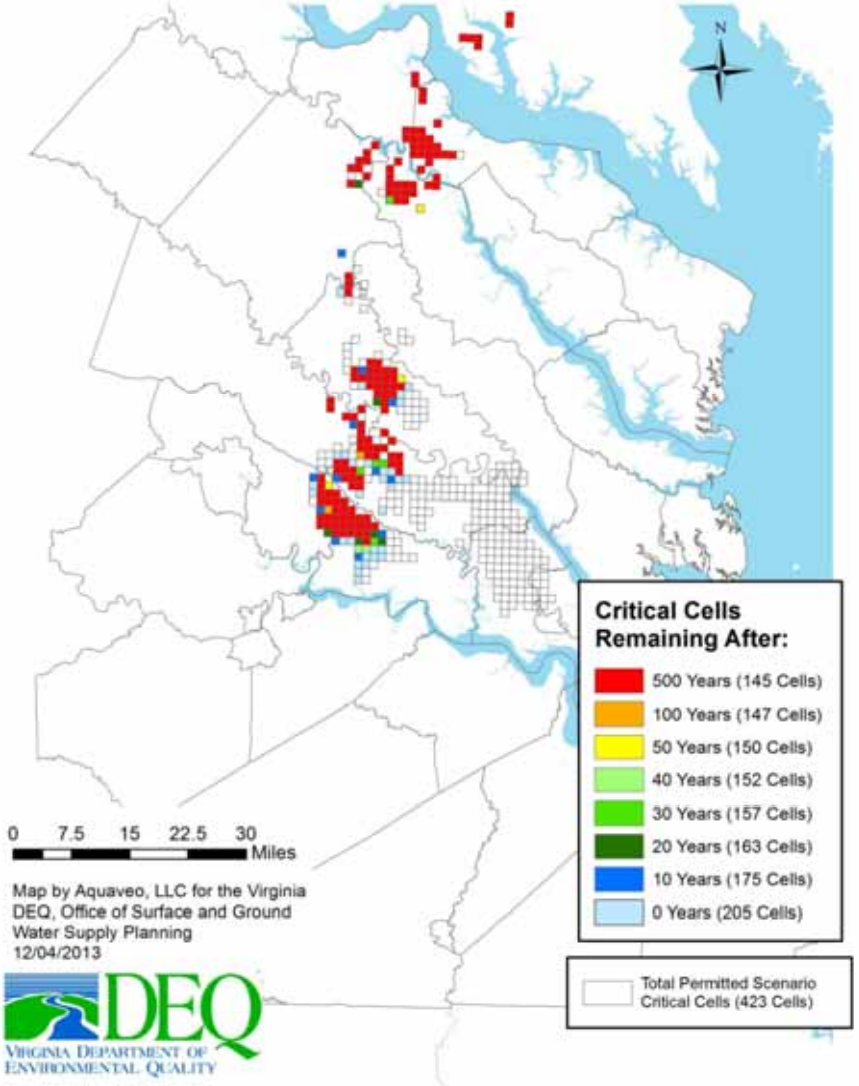
Virginia Groundwater Withdrawals by Aquifer



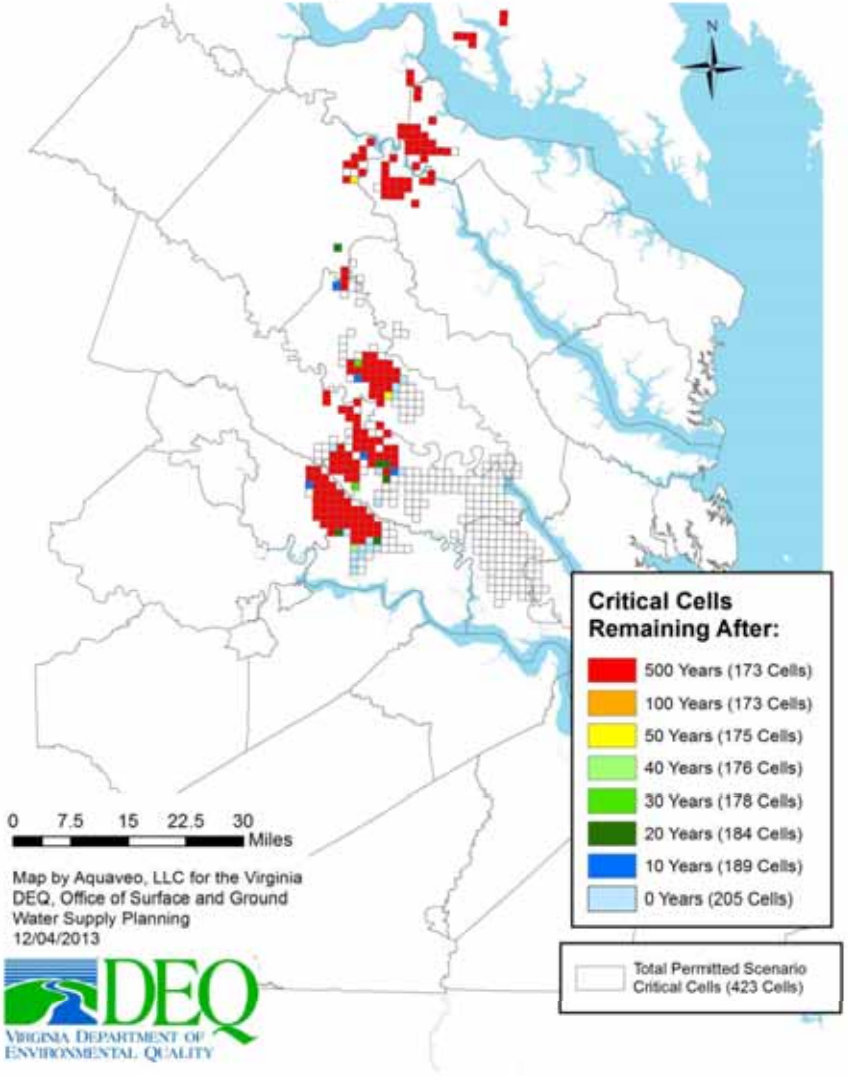
2013 Total Permitted: Piney Point



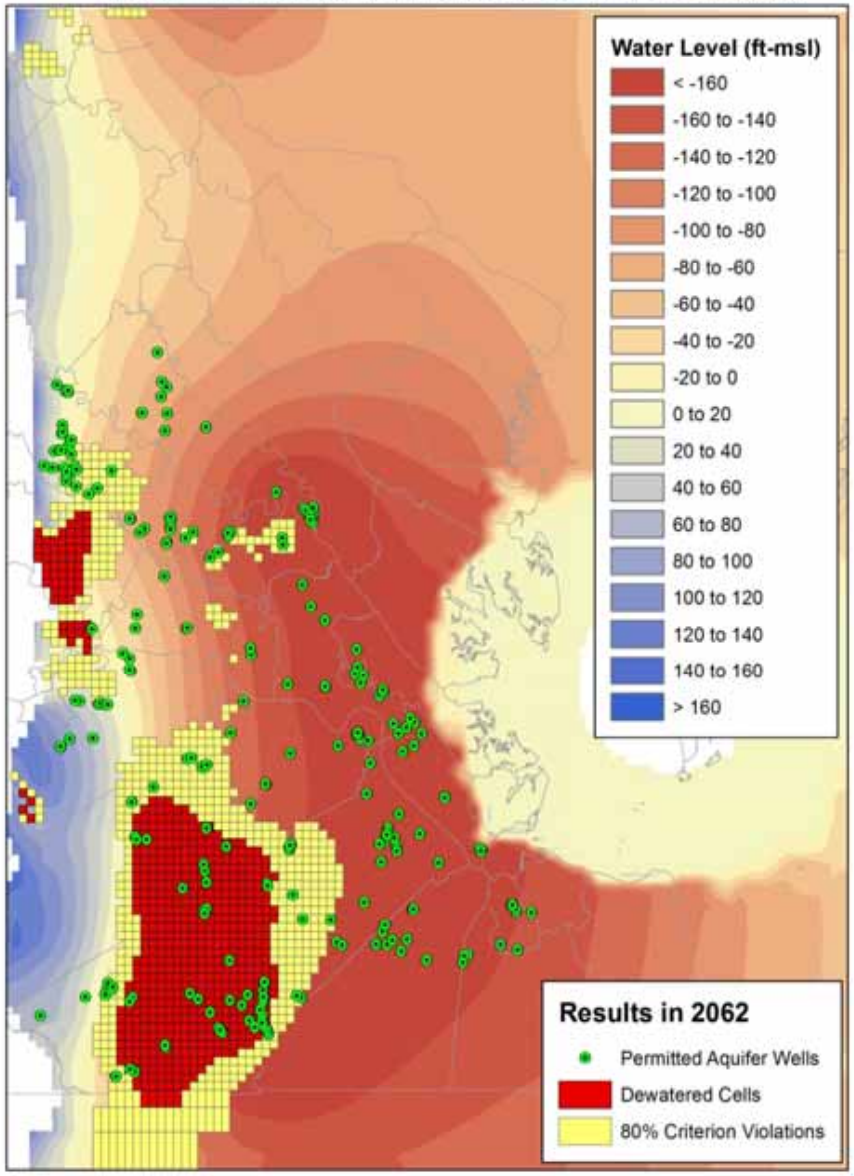
Senario: All GWMA Wells Off Piney Point Aquifer



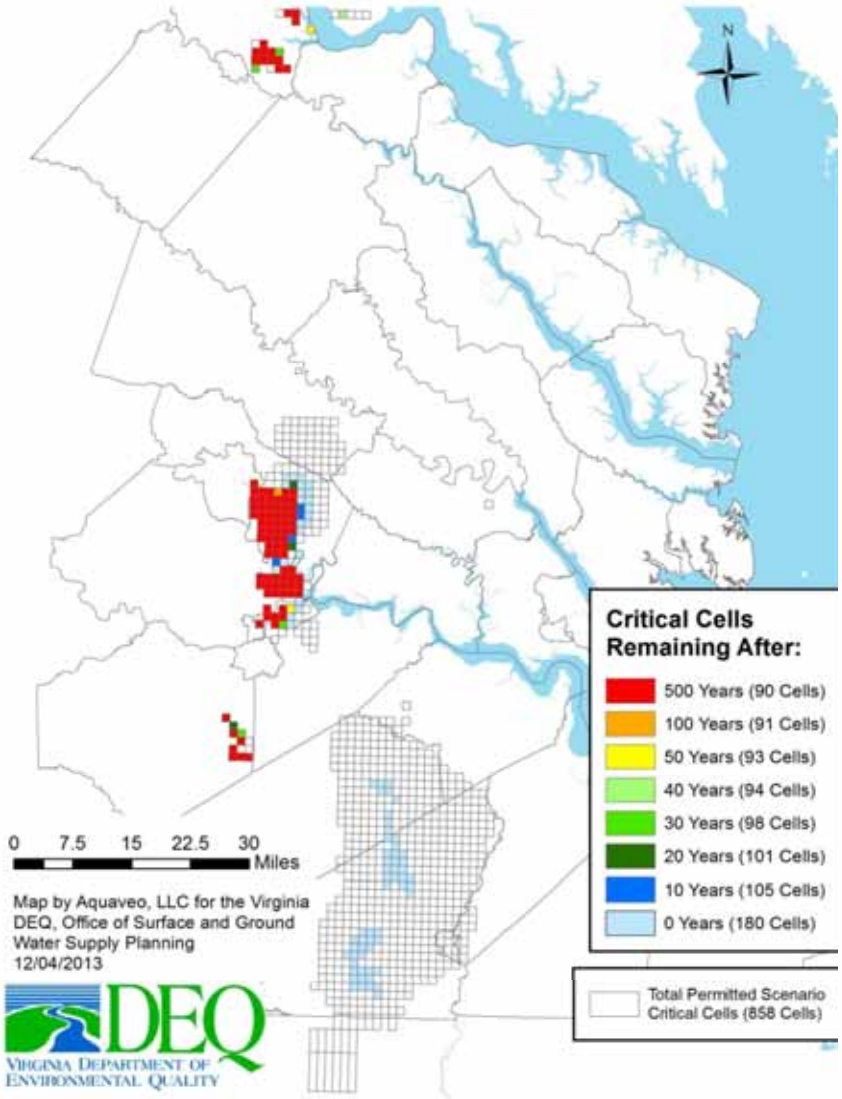
Senario: Largest Ten GWMA Withdrawals Off Piney Point Aquifer



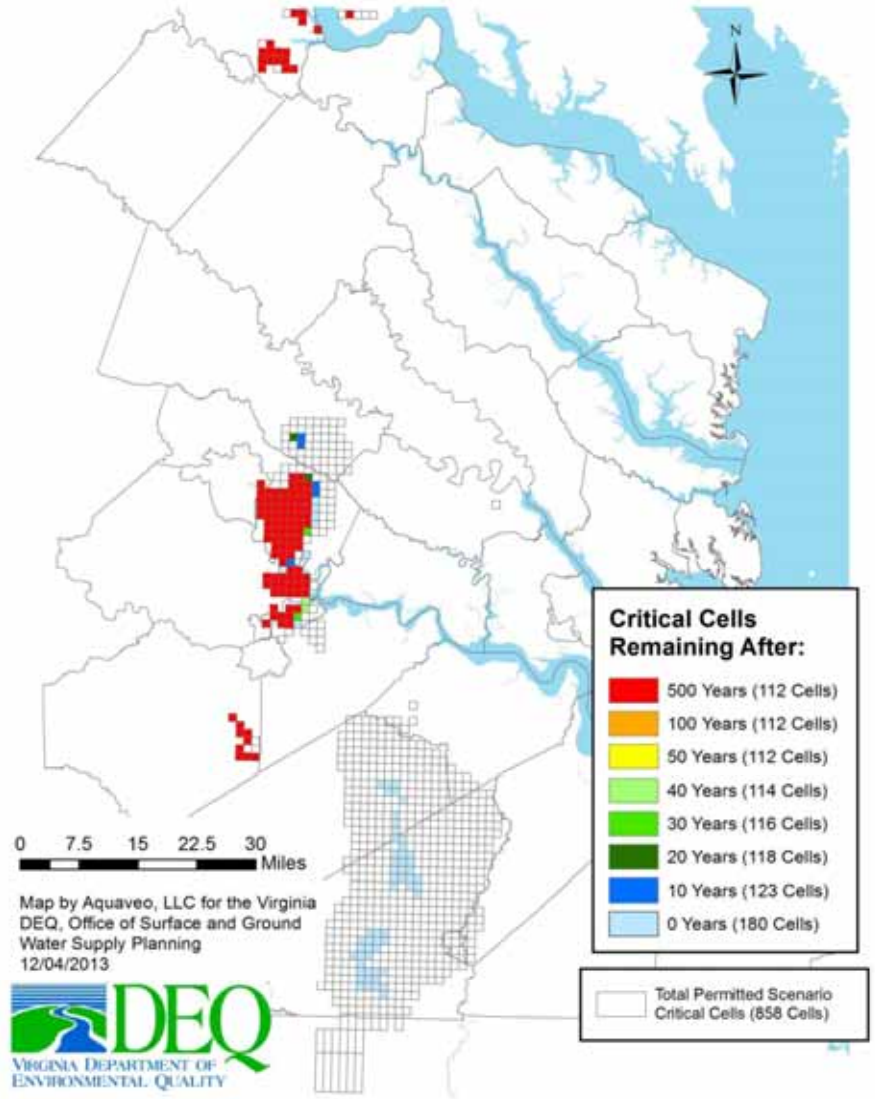
2013 Total Permitted: Potomac



Senario: All GWMA Wells Off Potomac Aquifer



Senario: Largest Ten GWMA Withdrawals Off Potomac Aquifer



Conclusions

- Water levels continue to decline in the primary aquifers.
- Land is subsiding.
- Salt water intrusion is occurring.
- Primary aquifers are not being pumped sustainably for the long-term.

Options Resulting From Peer Review

- Regulatory options include:
  - Reduce pumping
  - Spread out pumping
  - Modify management goals
  - Issue permits in regional or aquifer groupings
  - Implementation of greater water conservation
- Program recommendations include:
  - More data collection:
    - water levels
    - water quality
    - land subsidence
  - Implement new generation modeling tool
  - Increase program resources