



SUSSEX PRESERVATION COALITION

Educate ~ Advocate ~ Impact

Sussex Preservation Coalition

September 8, 2026

Tonight's Agenda

- Welcome – Joe Pika
- Shared Success: Forest Preservation Ordinance, FINALLY
- Upcoming Meetings:
 - Tuesday October 13 – Gina Jennings, Sussex County Finance Director – New education and EMS funding initiatives
 - Wednesday November 18 – Doreen Rushton, Human Resources Specialist – Who can afford what?
 - Tuesday December 15 – DelDOT Secy Shante Hastings

TUESDAY, SEPTEMBER 15, 2026 12:00-2:30 PM

The Cottage Cafe, 33034 Coastal Highway, Bethany

League of Women Voters

Rising Seas, Rising Stakes: Preparing Delaware for What is Next

SPEAKER

Danielle Swallow, Coastal Hazard
Specialist with Delaware Sea Grant,
University of Delaware

Lunch followed by presentation/Questions &
Answers. Fixed price limited menu and
separate checks provided

Reserve at sussexlwv.org

Tonight's Speakers

- **Thomas McKenna, Delaware Geological Survey**
- **David Edgell, Director Office of State Planning Coordination**
- **Brief Q&A for each**



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Thomas McKenna

- **Joined Delaware Geological Survey 1997**
- **Assoc. Prof. College of Earth Ocean and Environment**
- **Research Interests: ground-water/surface-water interaction; aquifer characterization; geothermics; tidal wetlands; and the evaluation of the quantity and quality of water resources.**



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David Edgell

- **Named Director of Office of Delaware State Planning Coordination in 2021**
- **Followed 18 years in OSPC spent as Kent County “circuit rider” + other responsibilities**
- **Previously: City of Dover, University of Delaware**
- **Currently: Route 9 Planning Area, Visioning Strategic Planning, Guidance for SB23 and HB450, Sussex Comprehensive Plan, Served on Sussex Land Use Reform Working Group**



Groundwater Resources of Sussex County

Tom McKenna, PhD, PG

***Delaware Geological Survey
University of Delaware***



**Sussex Preservation Coalition Meeting
Lewes, Delaware September 8, 2026**

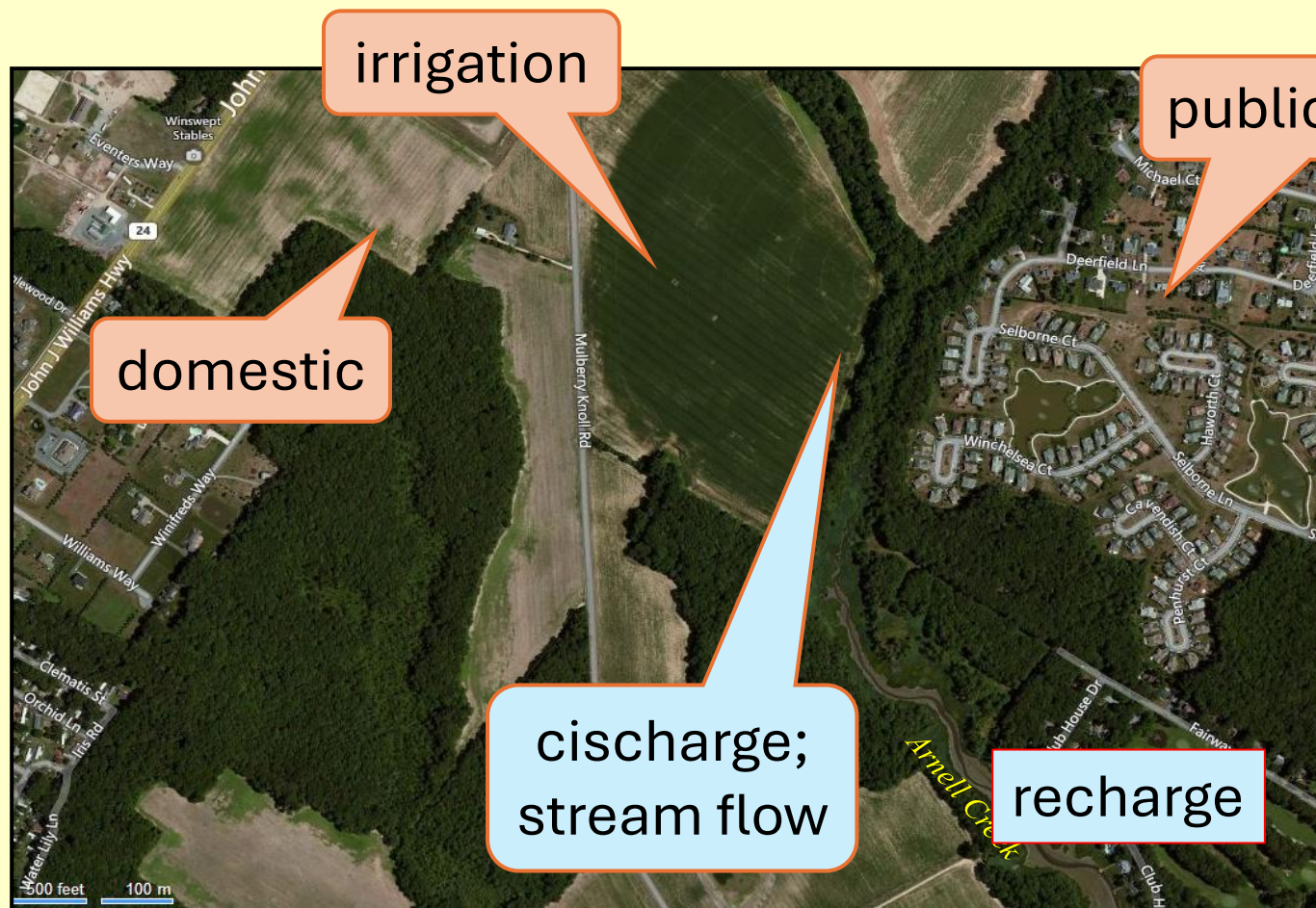
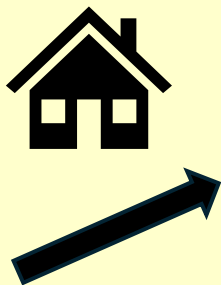
Water Resources Planning

Sussex County is fortunate to have abundant groundwater, but up-to-date knowledge is necessary for effective assessment and planning.

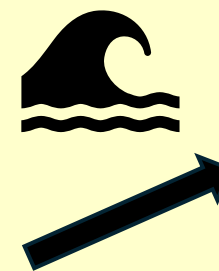
population



development



sea-level rise



Take Home Points

Groundwater is abundant in Sussex County, but management is still critical

Three primary aquifers are used.

Water use is 80 – 110 million gallons per day (MGD)

Dominated by agricultural crop irrigation

Recharge likely decreased from 2007 to 2022

3% of total water use in the county

Delaware Groundwater Monitoring Network

Currently expanding the network in Sussex County

Source Water Protection regulations are in place

Recharge and Wellhead Protection Areas

Saltwater contamination is a potential issue (monitored)

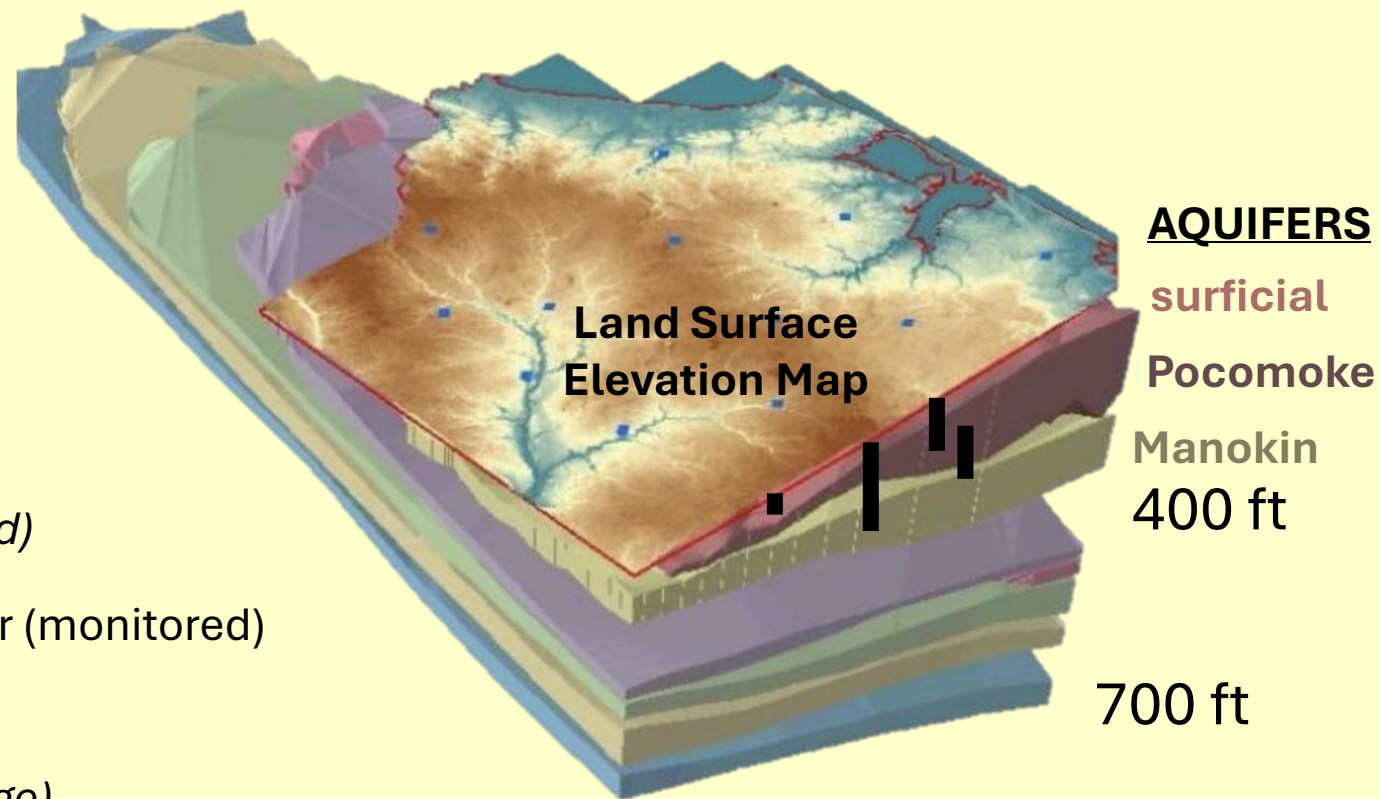
Sea-Level Rise / Land Subsidence impact groundwater (monitored)

Water table rise -

Waterlogging the roots of crops & flooding

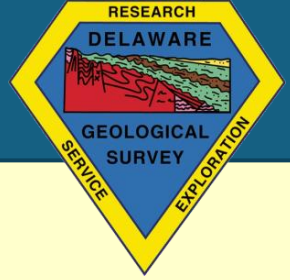
Saltwater contamination (sea-level rise & storm surge)

Nitrate contamination is a widespread issue in the surficial aquifer



Delaware Geological Survey

Science informing water-resources management



Science-based state agency housed at the University of Delaware.

Conduct geologic and hydrologic research and service for Delaware's government and citizens

Key partners include DNREC, DEMA, and DelDOT, and United States Geological Survey (USGS)

Serve on the Delaware Water Supply Coordinating Committee, and Delaware Drought Advisory Committee

Every state has a state geological survey that frequently partners with USGS



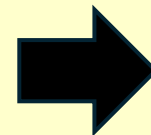


Good groundwater management depends on both
good science and strong partnerships.

- Scientists, regulators, utilities, and many stakeholders know one another.
- Management questions are often identified early.
- Long-term investment in science and monitoring has paid dividends.
- Science can move quickly into application.

DGS

Mapping → Monitoring → Assessment → Tools



DNREC Div. of Water

Water-Resources Management

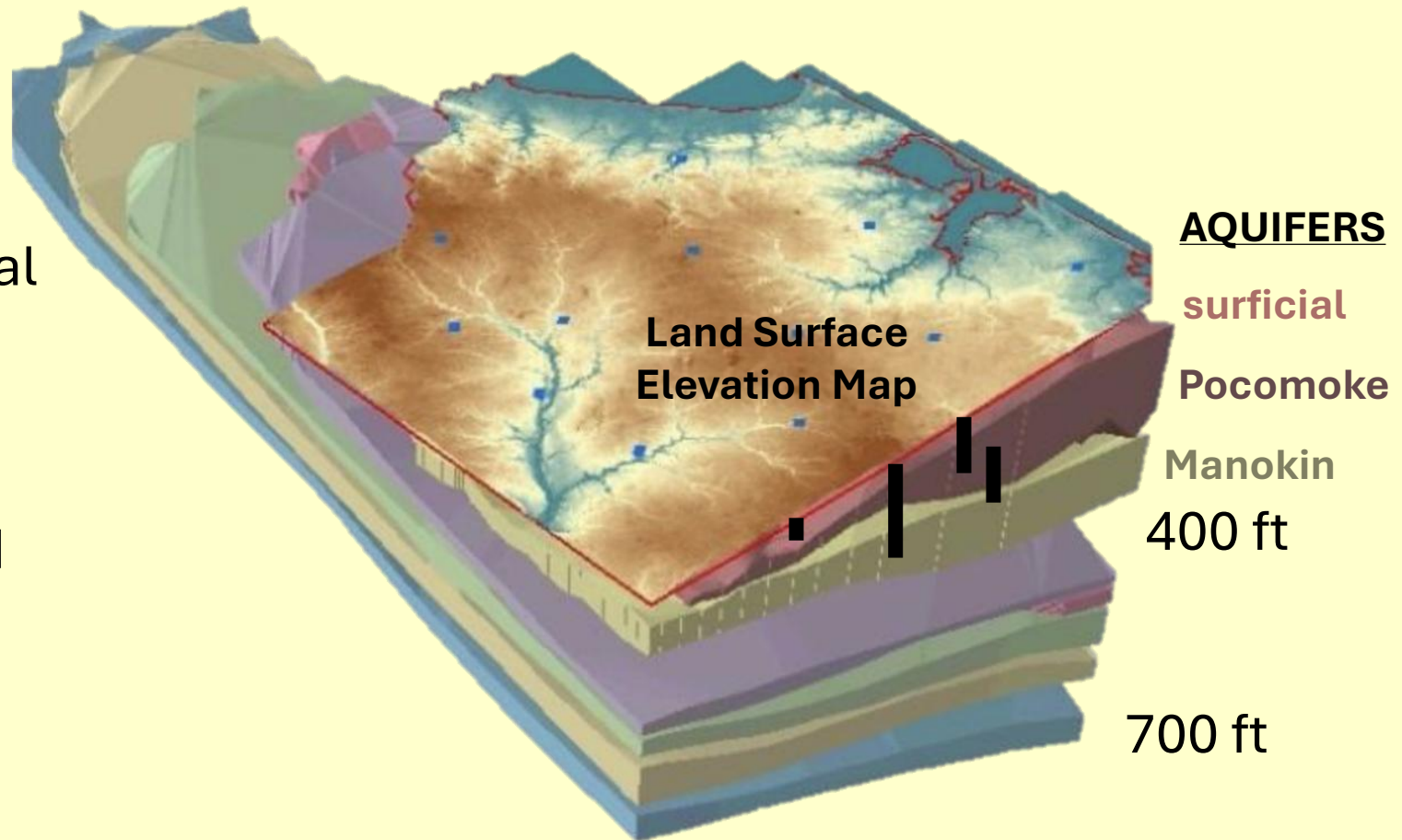
General Hydrogeology and Water Use

Water use in Sussex County is entirely from groundwater in sand aquifers

Precipitation recharges the surficial aquifer

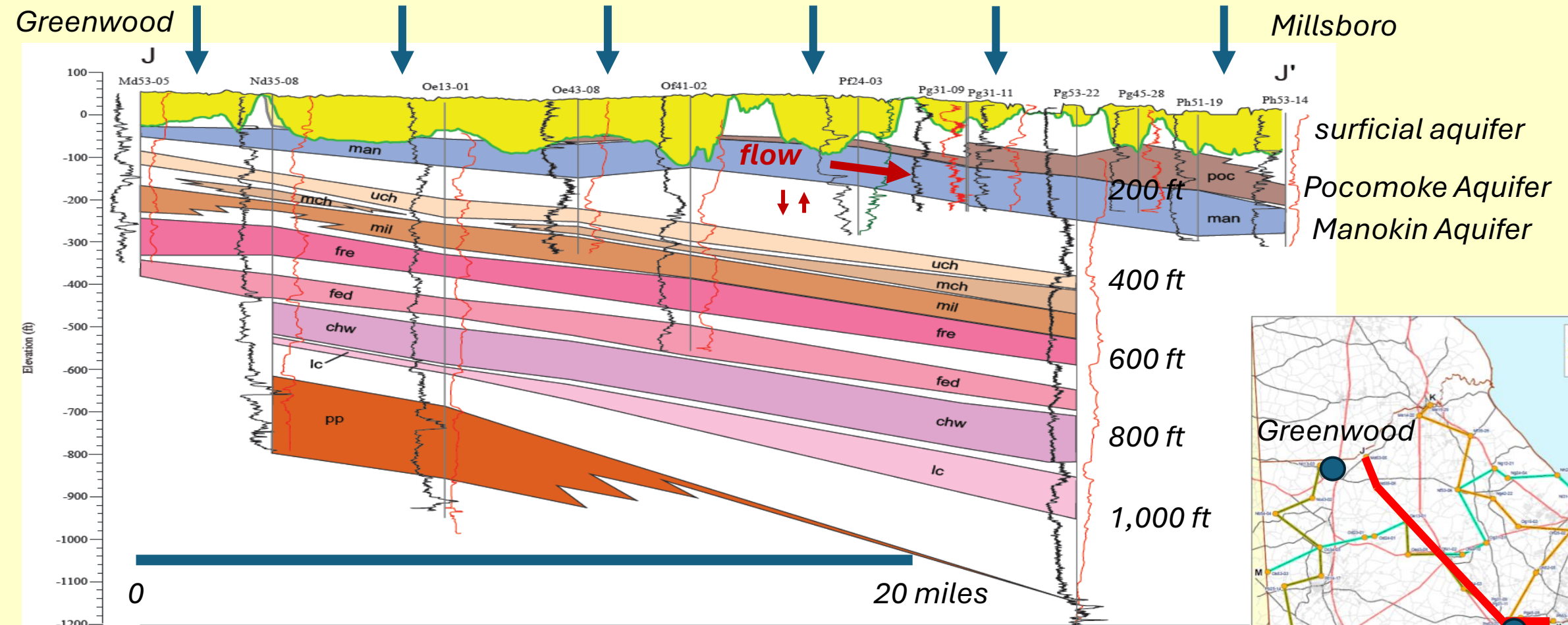
Groundwater is mostly pumped from the Manokin, Pocomoke, and surficial aquifers

Pumping is dominated by crop irrigation



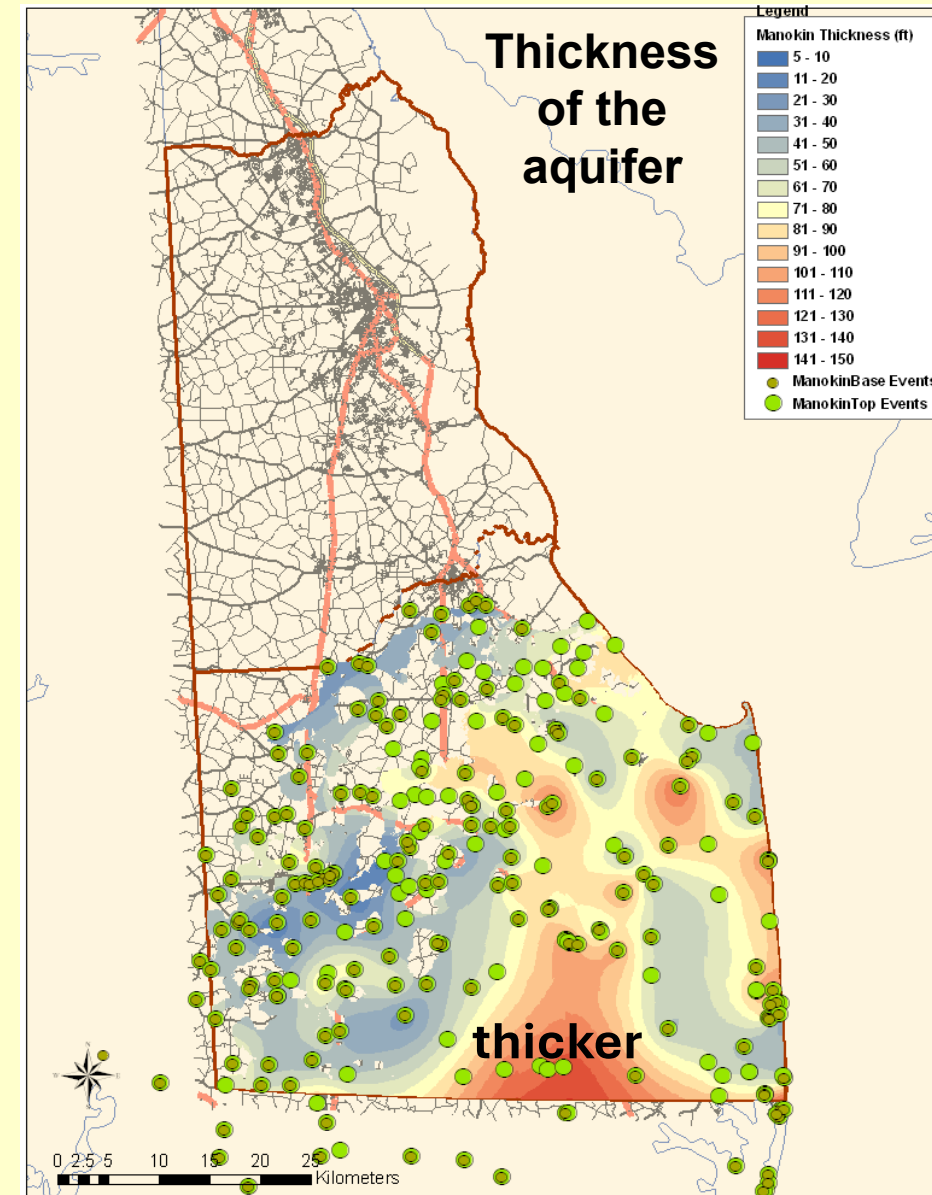
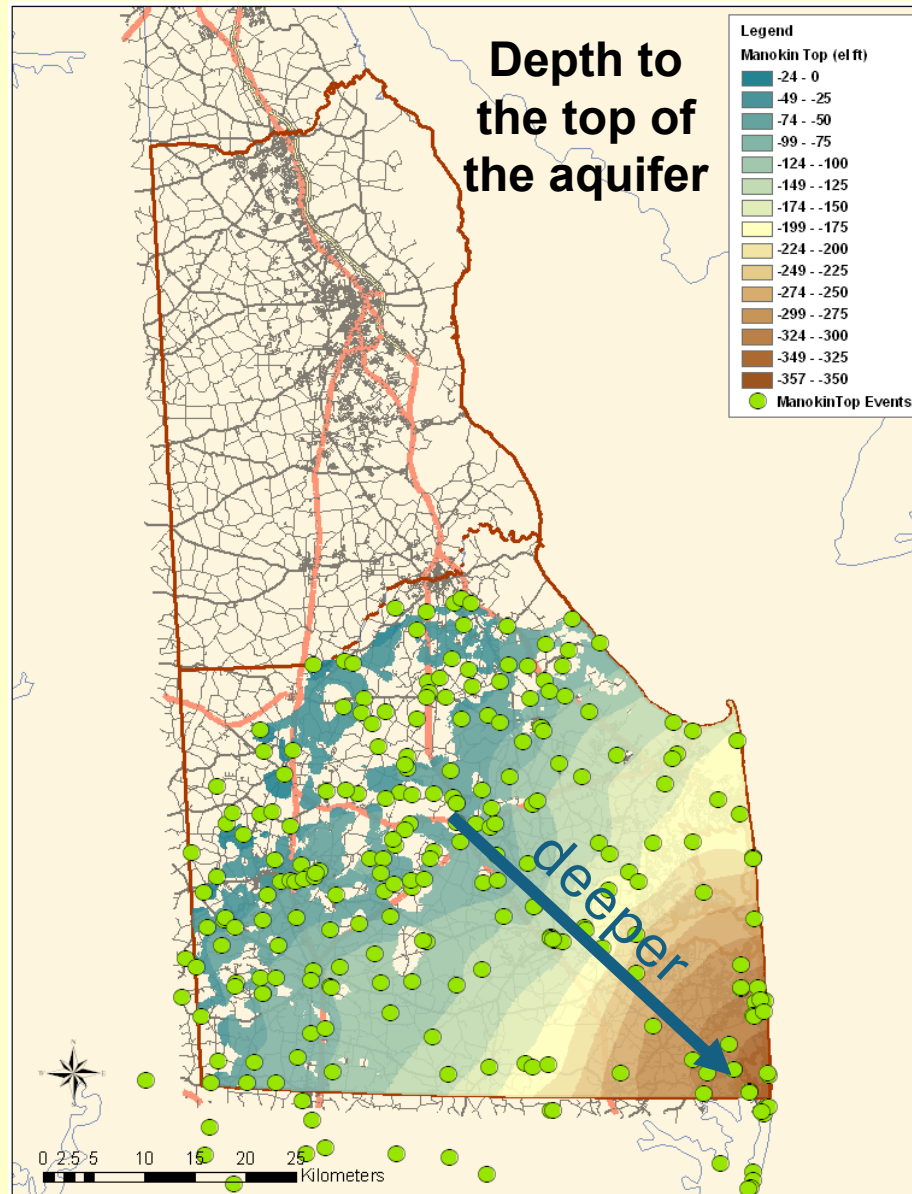
Aquifers, confining units, and recharge

recharge



Surficial aquifer (yellow) is an unconfined aquifer (water table aquifer).
All others are confined aquifers.
Aquifers are separated by confining units (white).

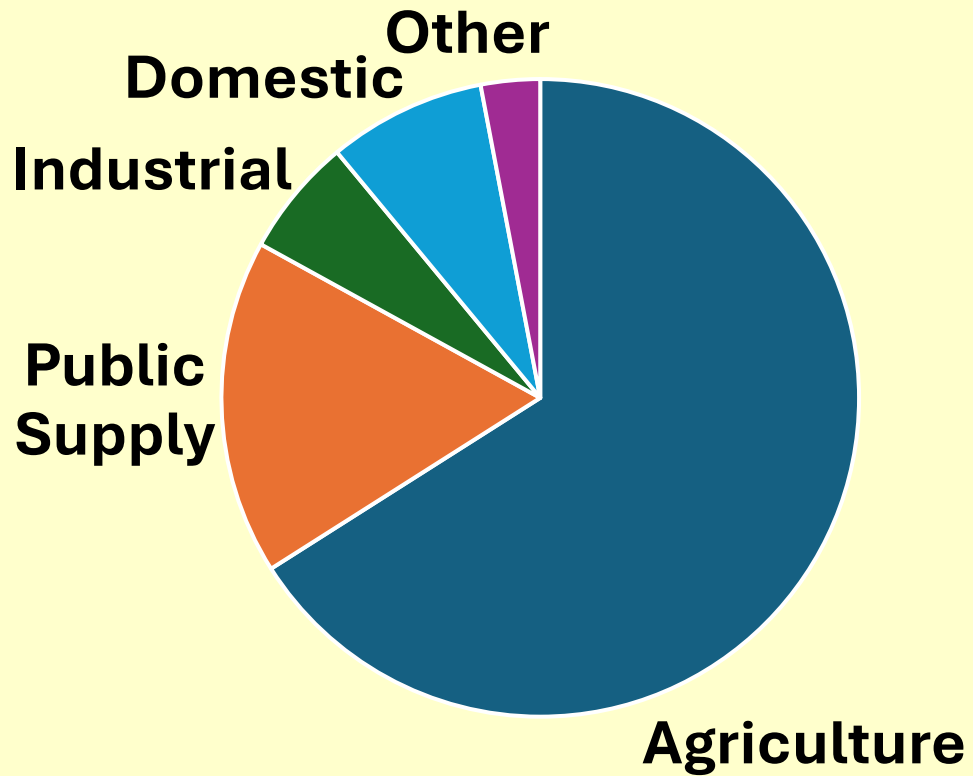
Manokin Aquifer



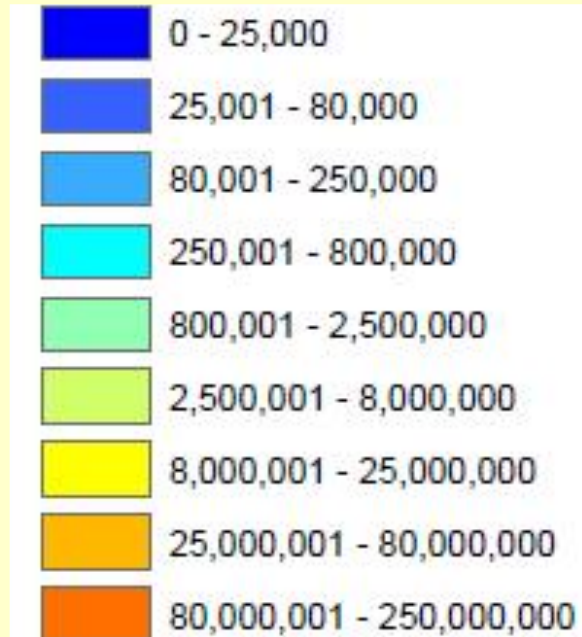
Water Use in Sussex County

90 MGD (80 to 110 MGD)

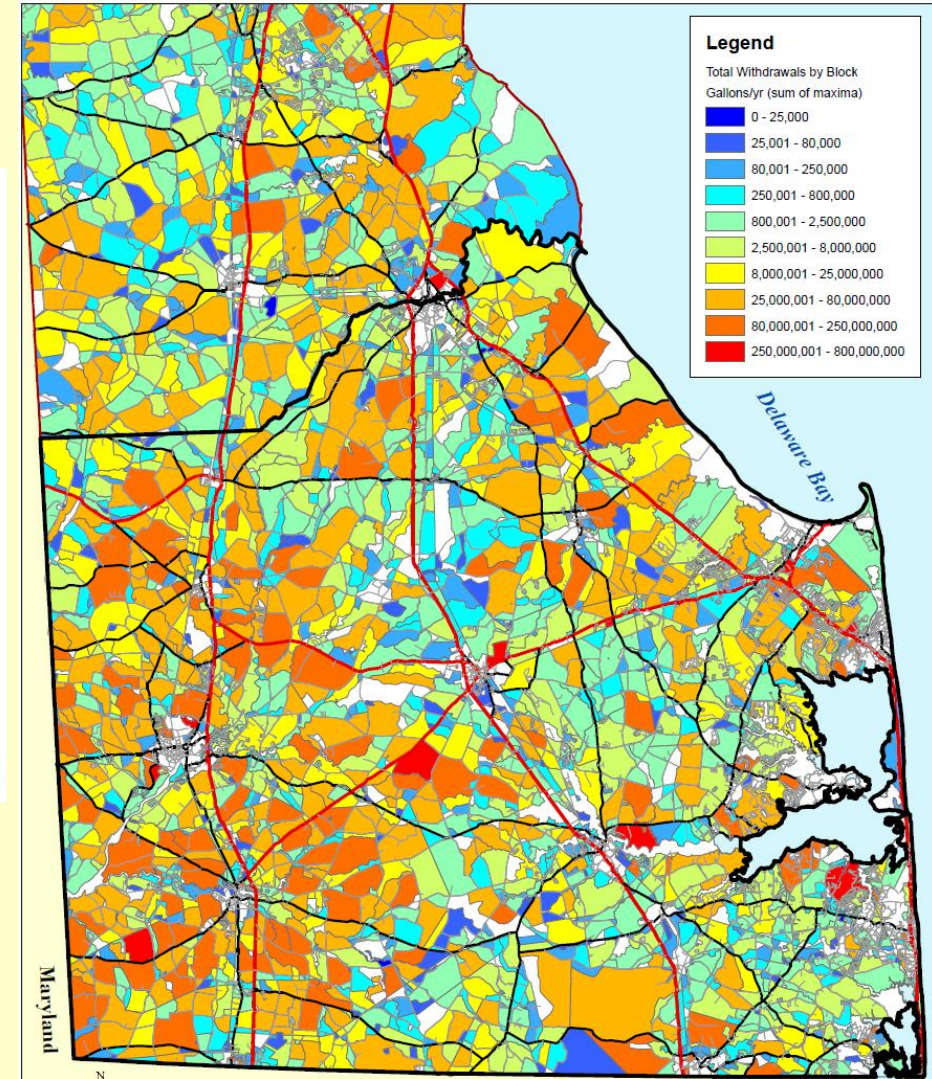
MGD = million gallons / day



gallons / yr



Water Use by Census Block



Groundwater Recharge Potential

14 inches of surficial aquifer recharge / year
30% of the 46 inches annual precipitation

Recharge = 128 MGD

Water use = 90 MGD (80 to 110 MGD)

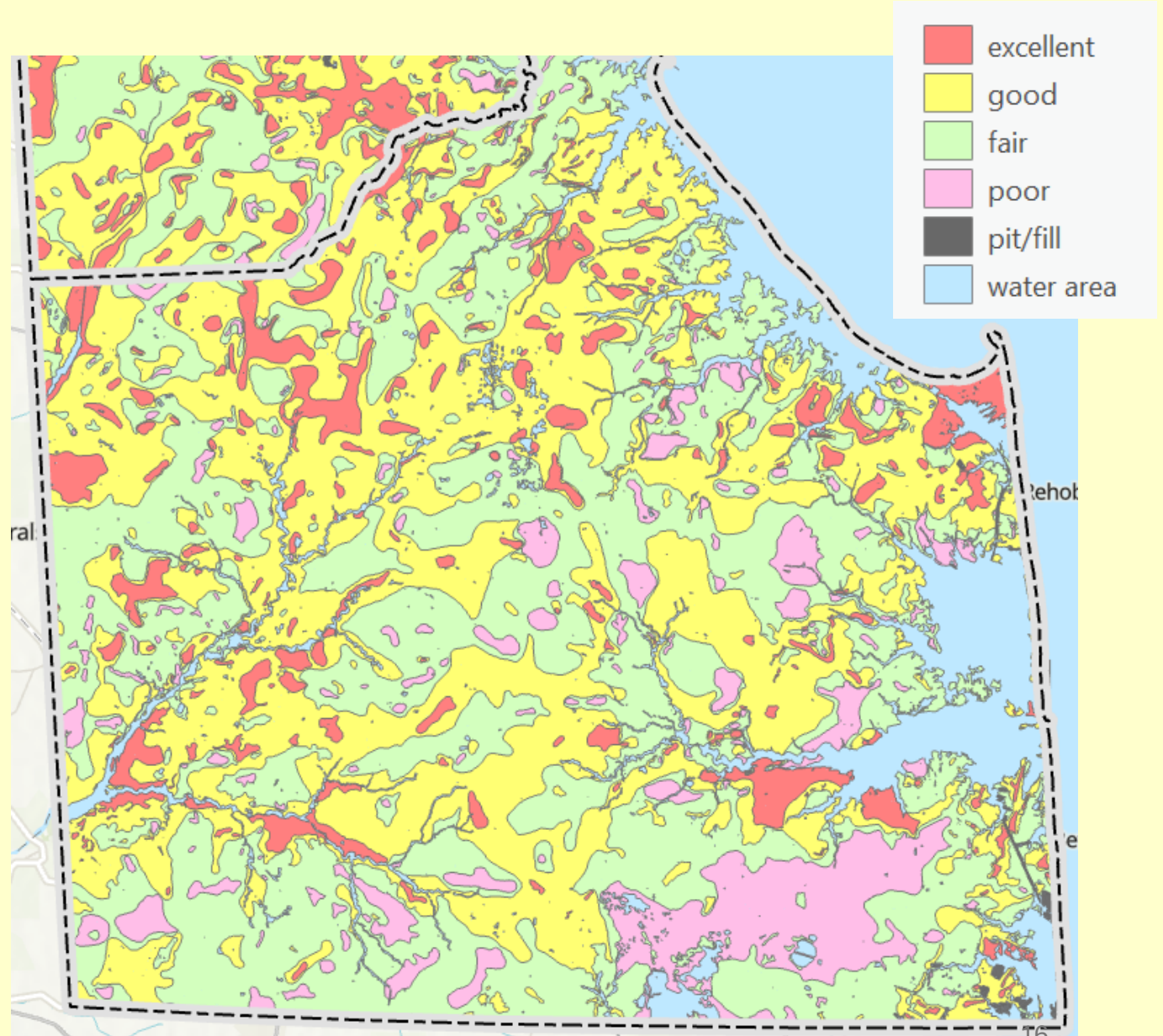
Between 2007 & 2022 (15 years):

20% of Sussex County was developed
Recharge likely decreased by ~ 3 MGD

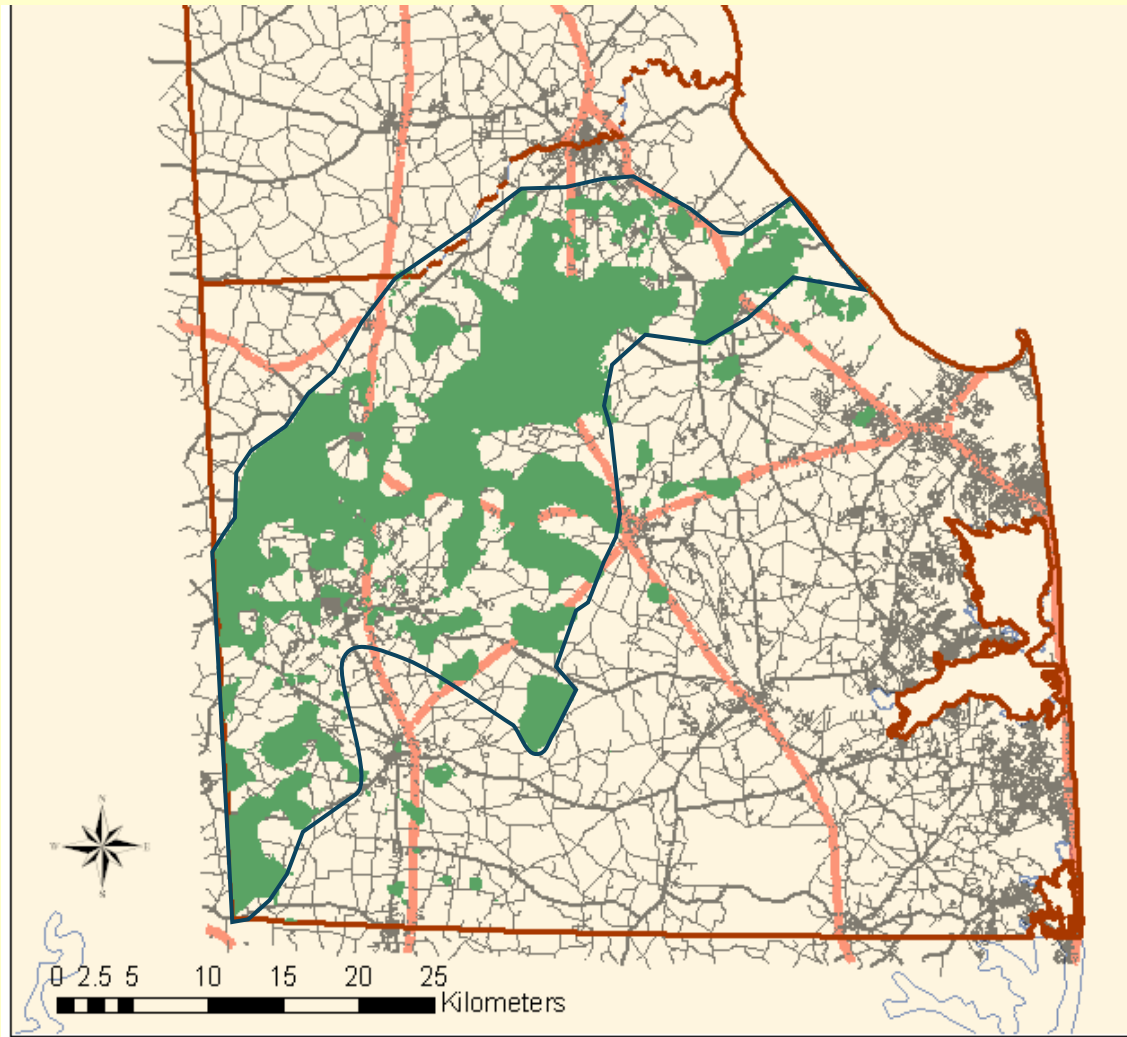
The decrease in recharge is ~ 3% of total water use.

Pumping is the major stressor.

MGD = million gallons / day



Recharge to the Manokin Aquifer



Green areas are “windows” through the confining unit between the Manokin and surficial aquifers, so they act together as one aquifer

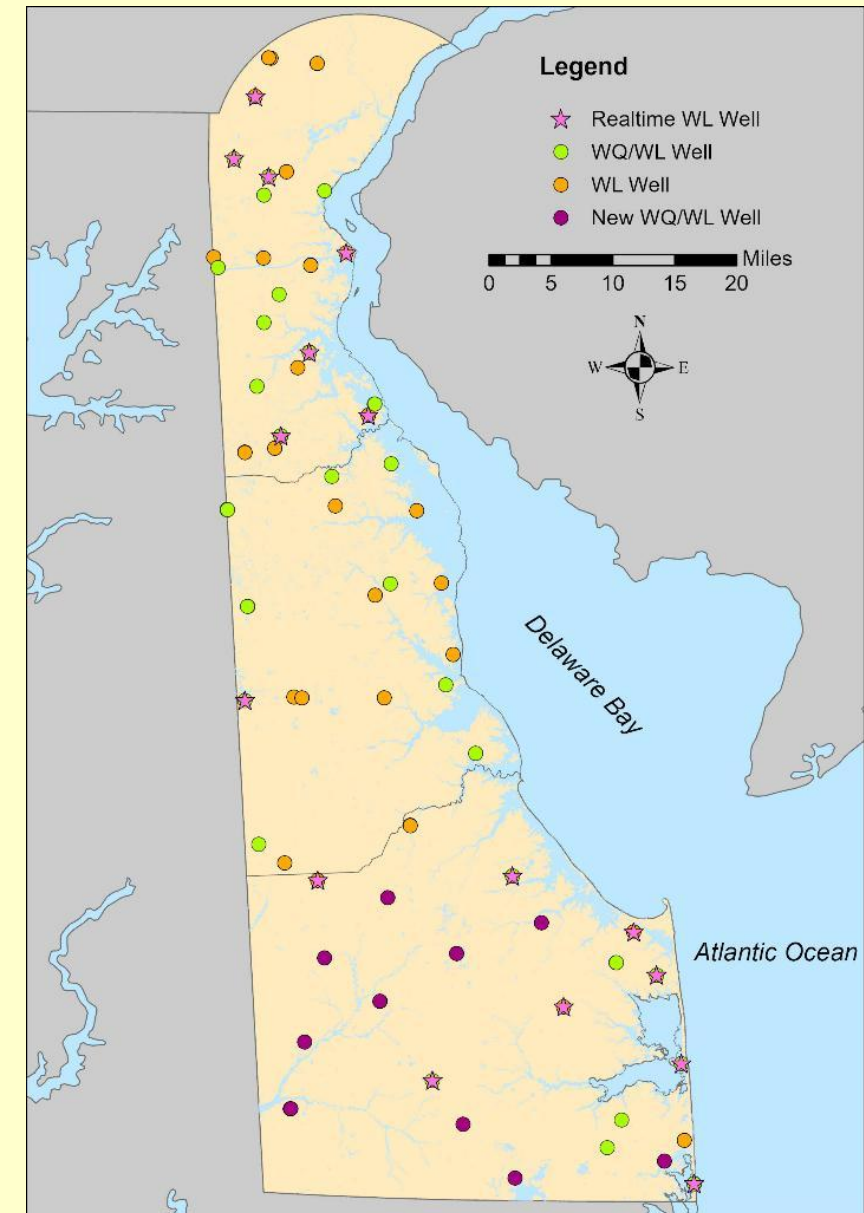
This is where the Manokin Aquifer is directly recharged by precipitation.

Delaware Groundwater Monitoring Network

- Core Mission:** Monitor and assess Delaware's groundwater resources.

- Long-Term Data:** Maintaining historical records to track long-term trends.

- Public Resource:** Providing reliable data for stakeholders, policymakers, and the public.



Growth of Delaware GWMN

**Key to growth: Support from regulators, stakeholders, and lawmakers
+ demonstrated value**

Phase I (FY2012)

New Castle / n Kent counties
FY2012: \$600,000
8 sites, 22 wells

Phase II (FY2017)

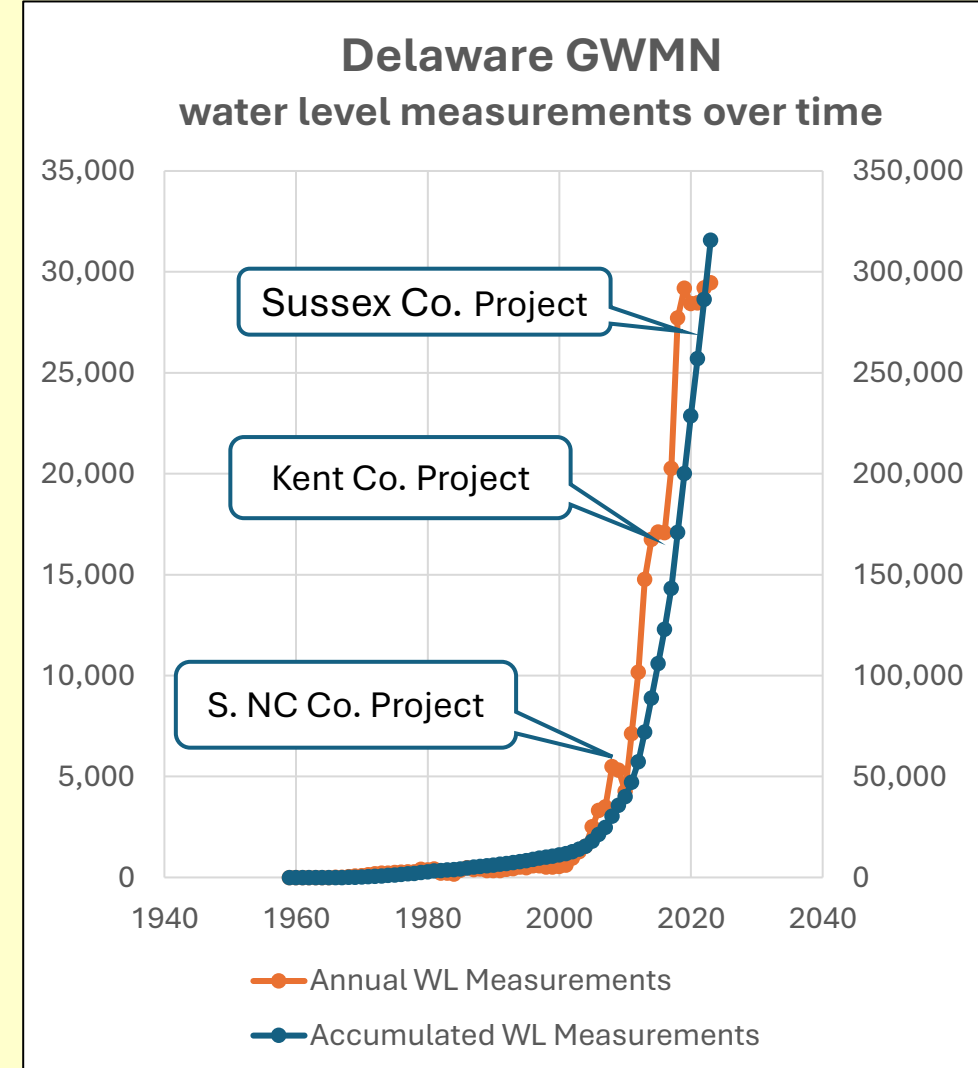
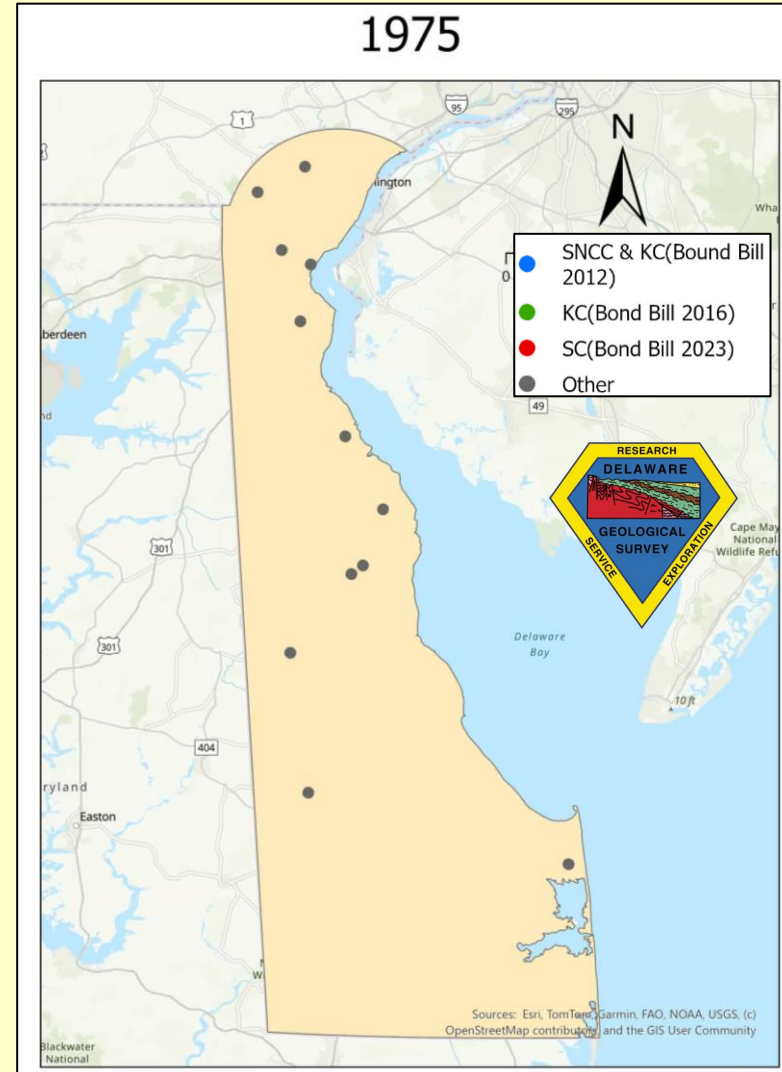
Kent County expansion
FY2017: \$713,000 State
10 sites, 42 wells

Phase III (FY2023–FY2025)

Sussex County expansion
FY2023-2025: \$788,000
12 sites, ~47 wells

Total Investment (so far)

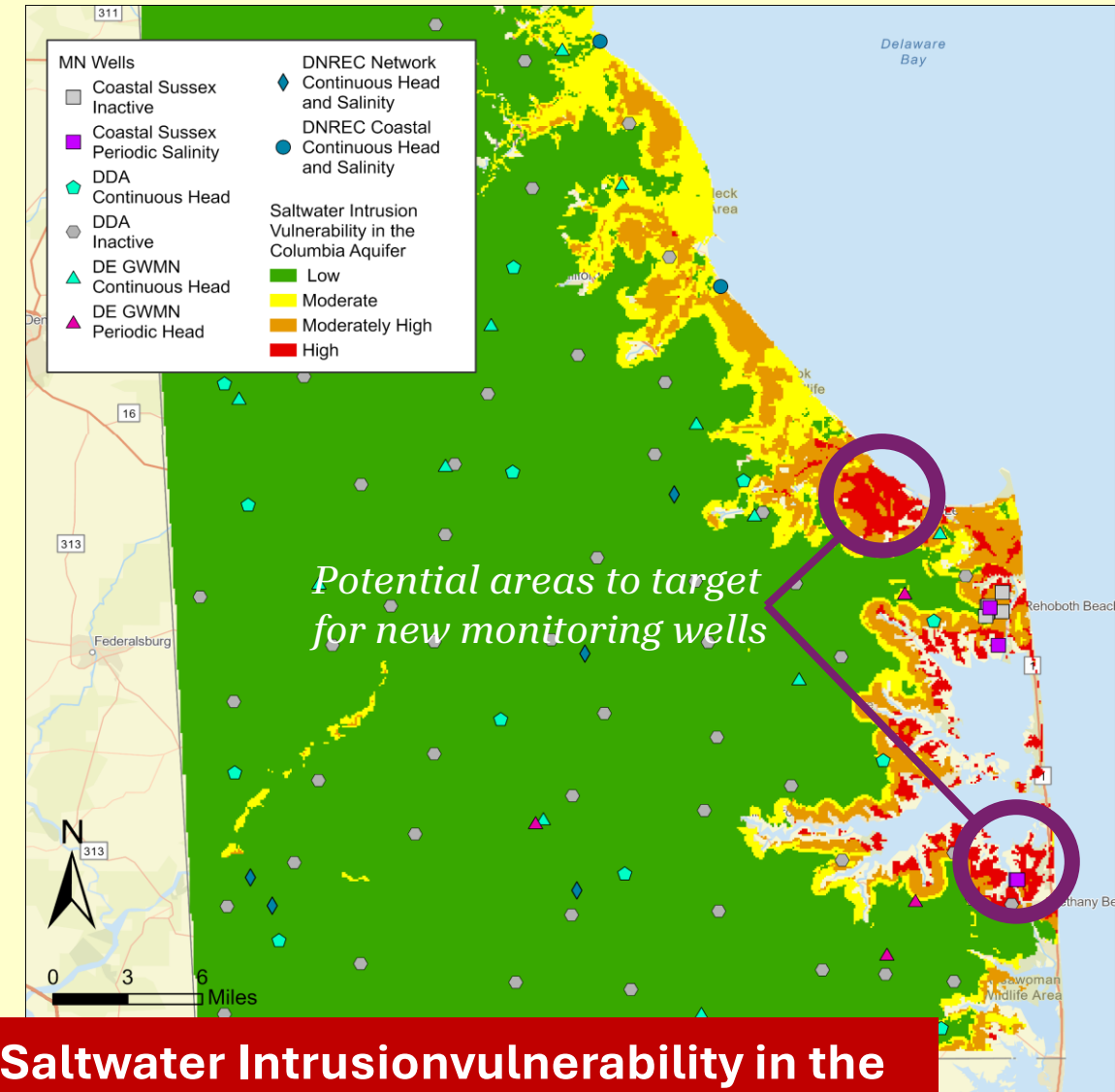
~\$2.1 million
30 sites, ~111 wells



Coastal Groundwater Salinity Monitoring

Identifying and evaluating areas most vulnerable to groundwater salinization

- Salinization drivers: sea-level rise, storm surge, coastal flooding, and groundwater withdrawals
- Collaborative project: DGS, DNREC, and University of Delaware researchers
- Builds on the groundwater monitoring network to address emerging coastal groundwater issues

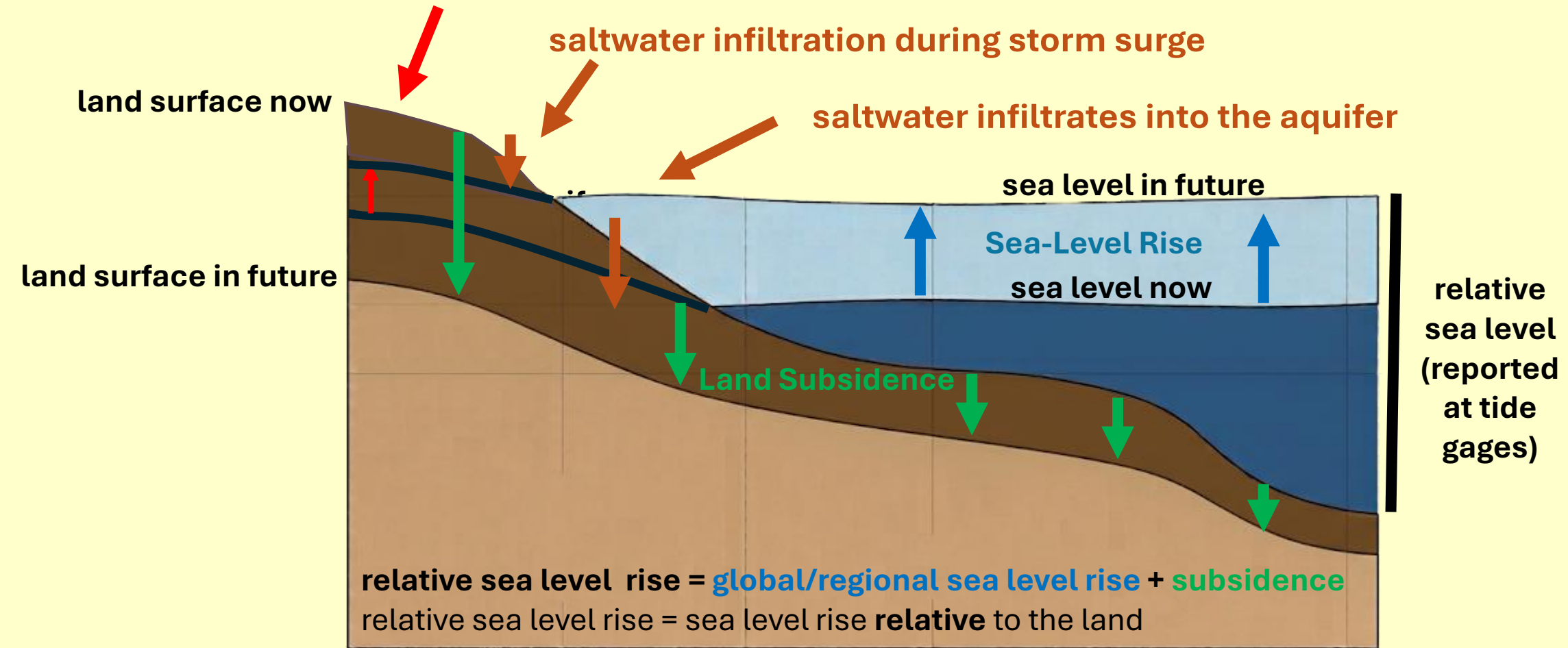


Saltwater Intrusion vulnerability in the surficial aquifer

Pumping and groundwater level are very important

Sea-Level Rise & Land Subsidence Impact Groundwater

The water table rises and can waterlog the roots of crops and contribute to flooding



Delaware Water Tracker

Developed during 2024–2025 drought as a framework for evaluating groundwater levels statewide

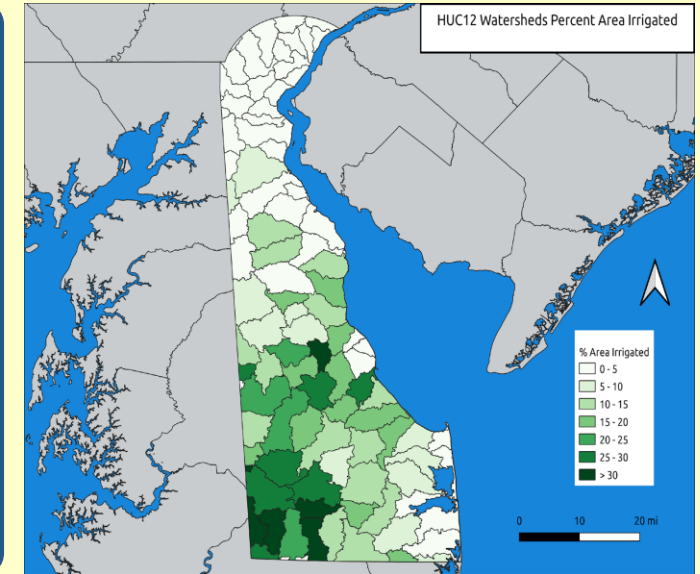
Partnership among:

- Delaware Geological Survey (UD)
- Center for Environmental Monitoring and Analysis / Office of the State Climatologist (UD)
- Delaware Department of Natural Resources and Environmental Control (DNREC)
- Delaware Water Supply Coordinating Council (WSCC)

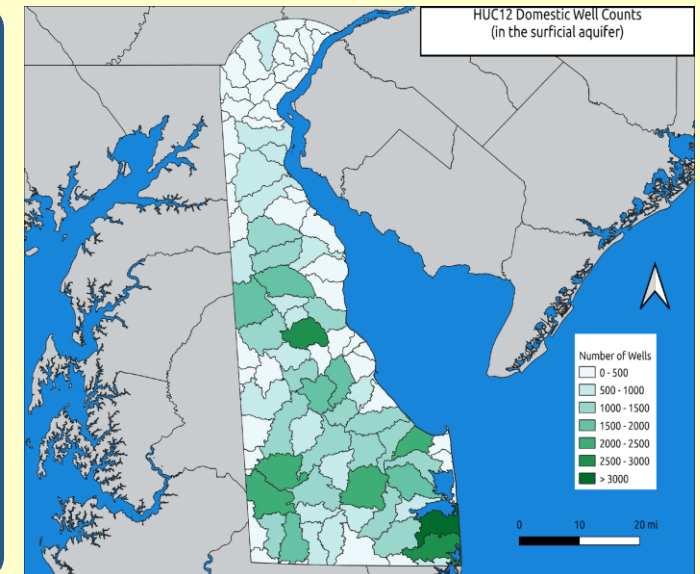
Analysis integrates:

- Climate observations
- Streamflow data
- Groundwater levels

Ag Irrigated Area

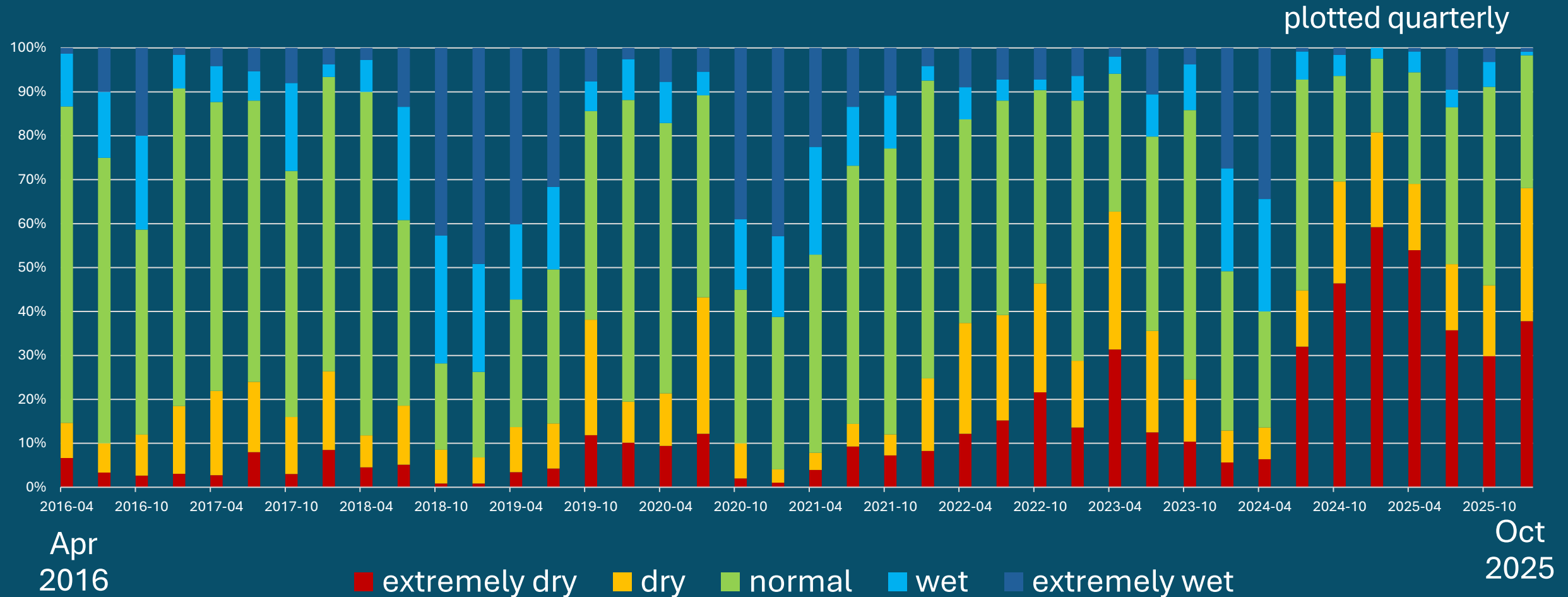


Domestic Well Area



Delaware Water Tracker

Recent Groundwater Conditions in the Surficial Aquifer (Drought Focus)

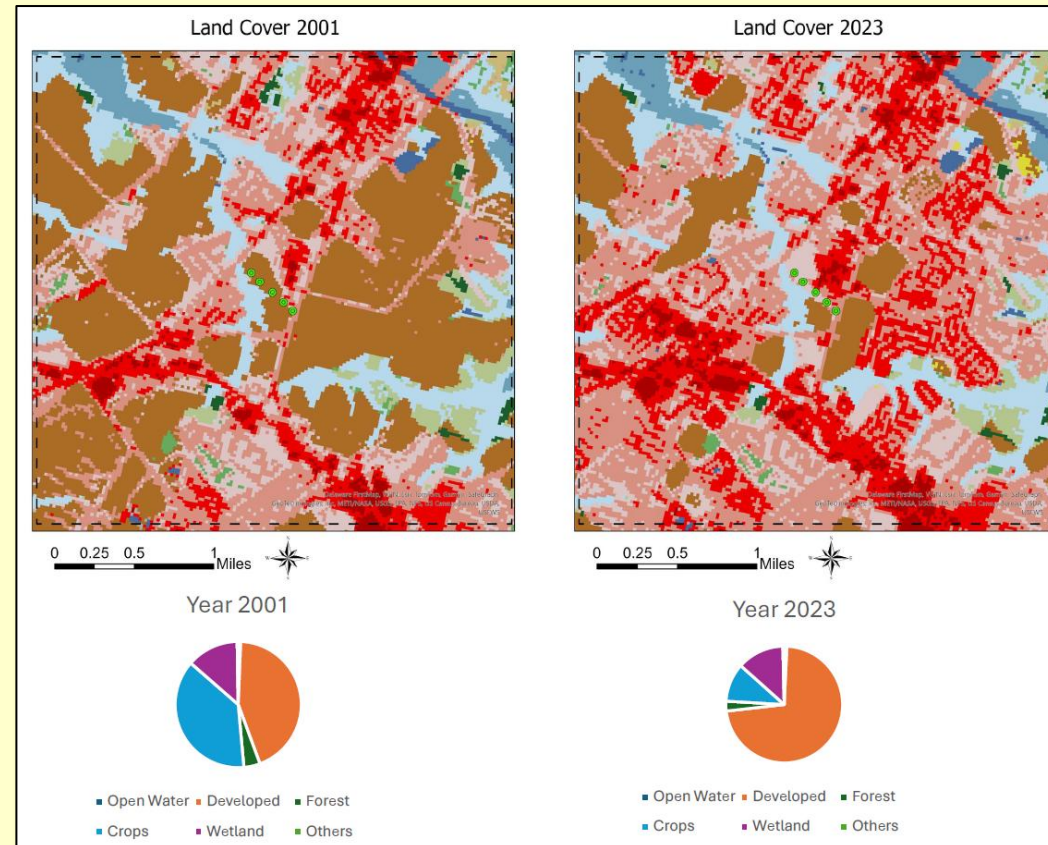
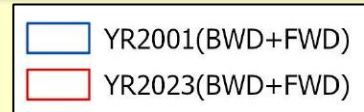
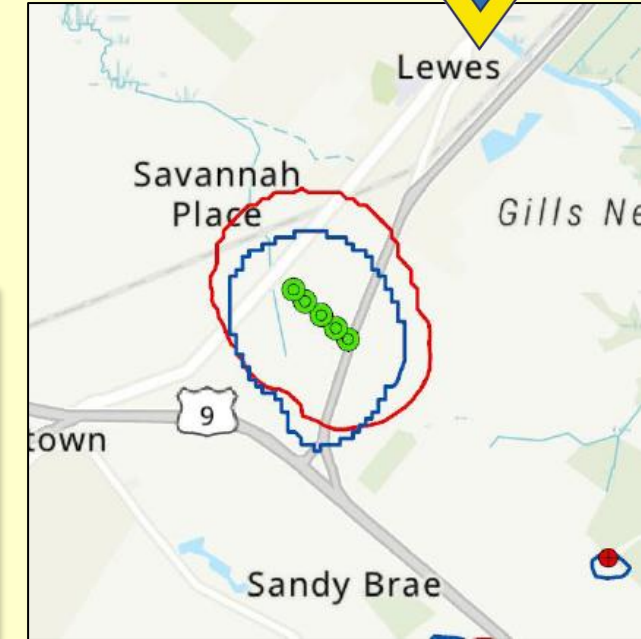


Wellhead Protection Project



Updating Wellhead Protection Areas in Lewes-Rehoboth Area

Hydrogeologic mapping, groundwater monitoring, and groundwater-flow modeling provide the foundation for protecting public water supplies in rapidly developing areas



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