

# Saltwater Intrusion in Delaware:

## *Identifying Vulnerabilities and Closing Knowledge Gaps*

Center for the Inland Bays  
Scientific Technical Advisory  
Committee meeting

April 10, 2026

## Phase I – Data gap assessment

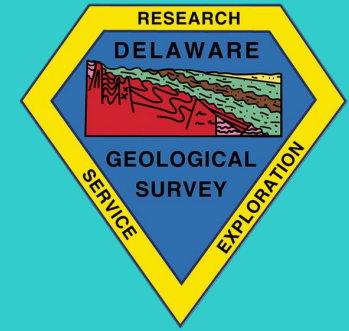
1. Where has been/is saltwater intrusion been observed in the state?
2. Where do we think saltwater intrusion may occur?
3. Are we monitoring these areas?
4. Is the monitoring appropriate for what we're trying to study?

## Phase II – Vulnerability study

What areas of the state are at high risk for saltwater intrusion  
Based on physical hydrogeology and water use

## Phase III – Monitoring

Install new wells and equipment  
Target vulnerable areas identified in this study  
*(New wells coming in 2026!)*



Amanda Sprague-Getsy

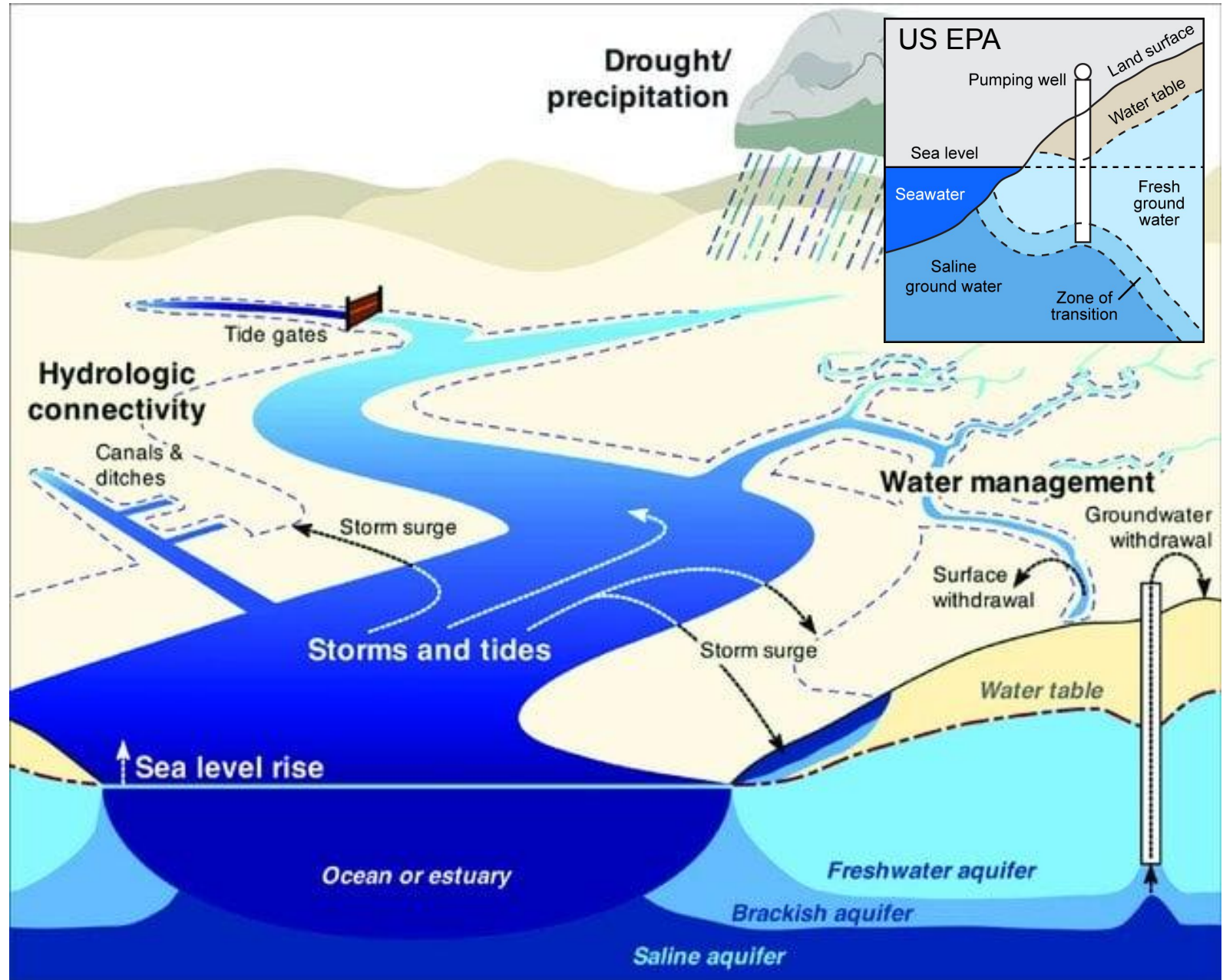


Holly Michael, Romana Ibrahim



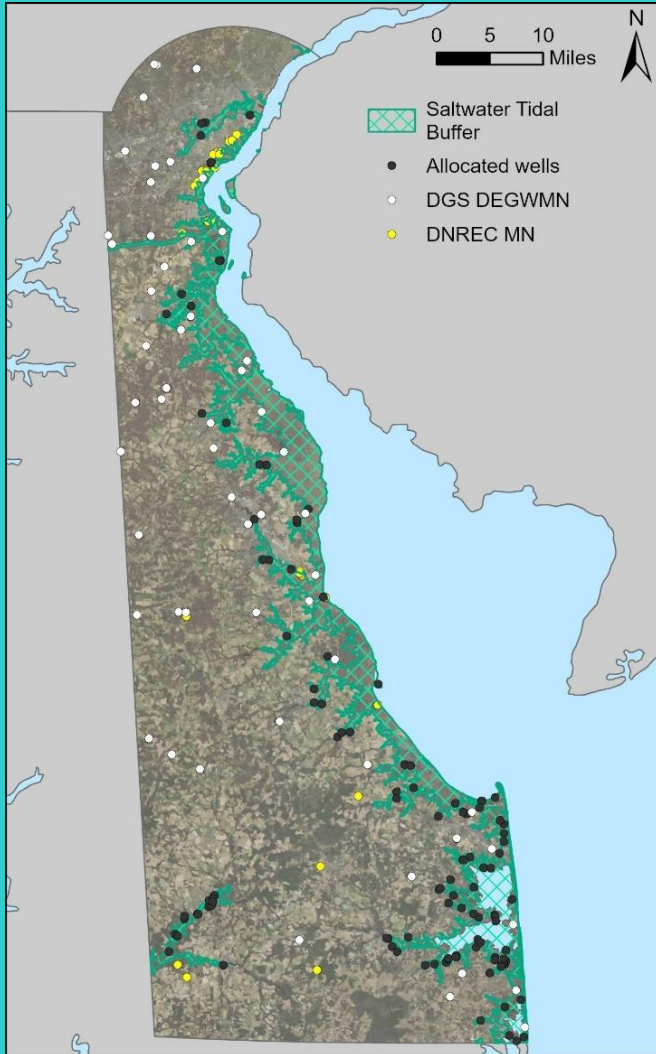
Ashley Norton, Matt Grabowski,  
Amber Bataille, Scott Strohmeier,  
Sam Tracy

# Saltwater Intrusion VS Salinization



Tully et al., 2019

# SWI in Delaware



## Surficial aquifer (salinization)

SWI is happening in coastal areas where human influence alters groundwater levels (pumping, ditching) in conjunction with environmental factors such as sea-level rise, drought, and geologic setting

## Potomac aquifer

Potential for SWI in areas just north of the C&D Canal, where the aquifer outcrops near the surface and water use is heavy

## Bowers Beach

“Hot spots” of high chlorides around certain domestic wells

## Coastal Sussex County

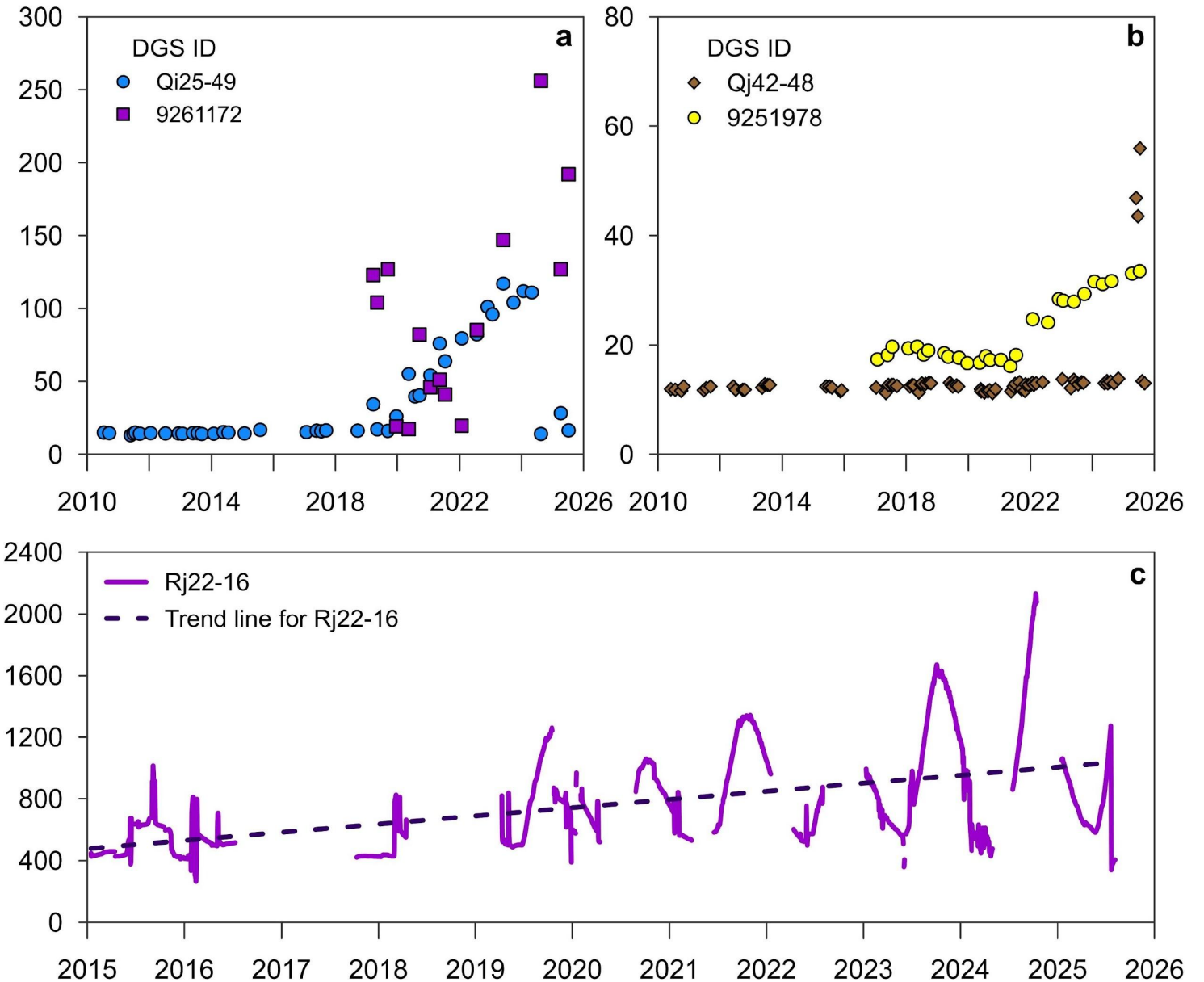
Surficial, Pocomoke, and Manokin aquifers are pumped for water, land use is changing and population increasing significantly

# Salinity Trends

8 Potomac aquifer wells in New Castle Co had a moderate or strong increasing trend; concentrations still below EPA drinking water thresholds

Many wells in the Surficial, Pocomoke, and Manokin aquifers in coastal Sussex Co have increasing salinity trends

## Coastal Sussex monitoring



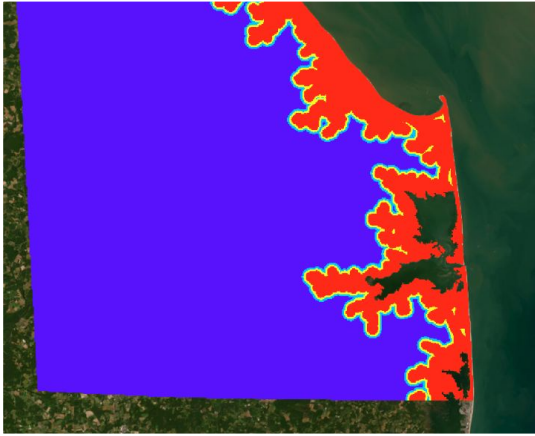
# Vulnerability Analysis

## **GALDIT-P**

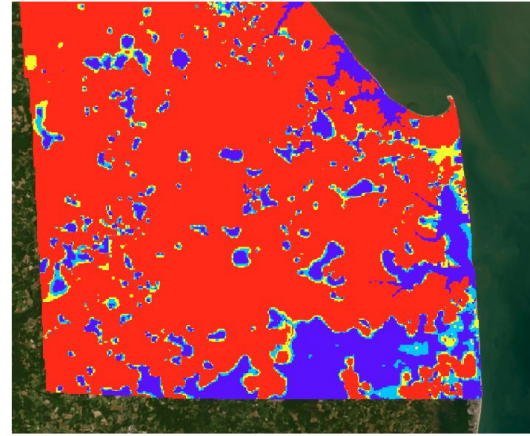
GIS-based assessment specific for saltwater intrusion in coastal areas

$$GALDIT\ Index = \frac{\sum_{i=1}^7 W_i R_i}{\sum_{i=1}^7 W_i}$$

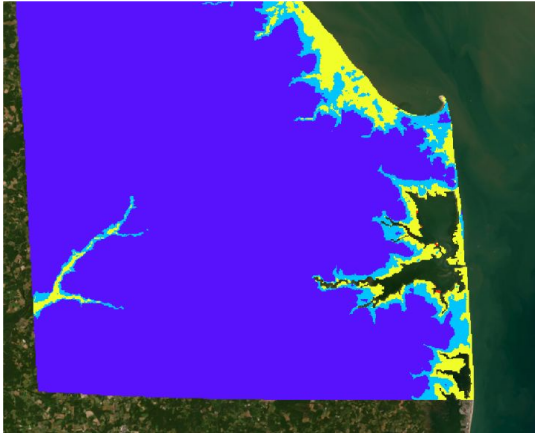
- G** Groundwater occurrence (aquifer type)
- A** Aquifer hydraulic conductivity
- L** Level, water level
- D** Distance to shore
- I** Impact of SWI
- T** Thickness of aquifer
- P** Pumping



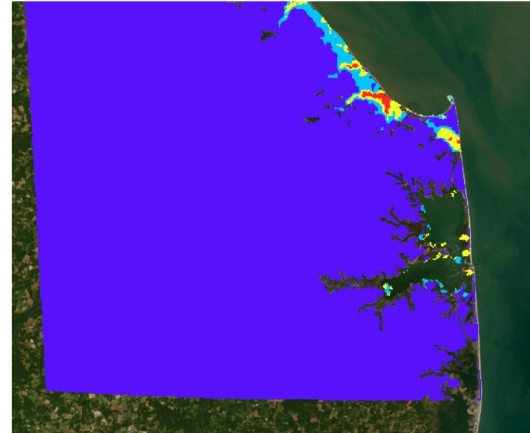
Distance to shore



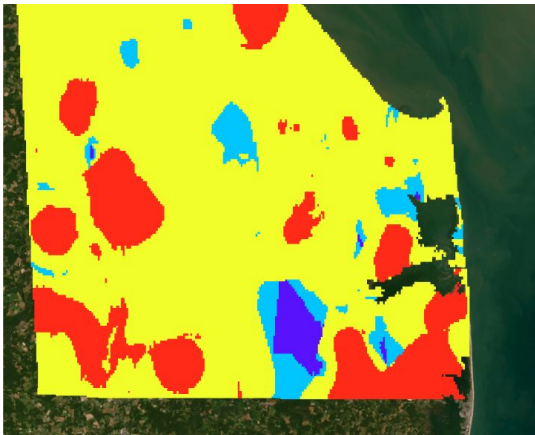
Aquifer thickness



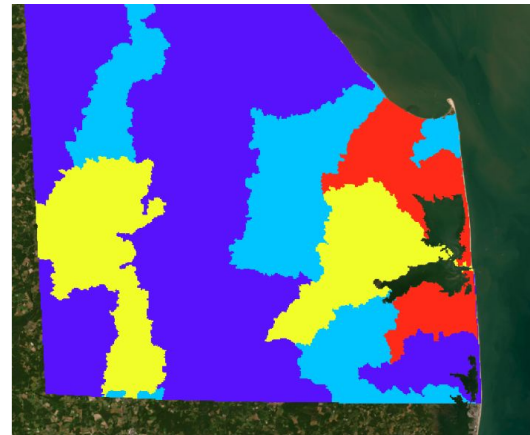
Groundwater level



Existing impact of SWI

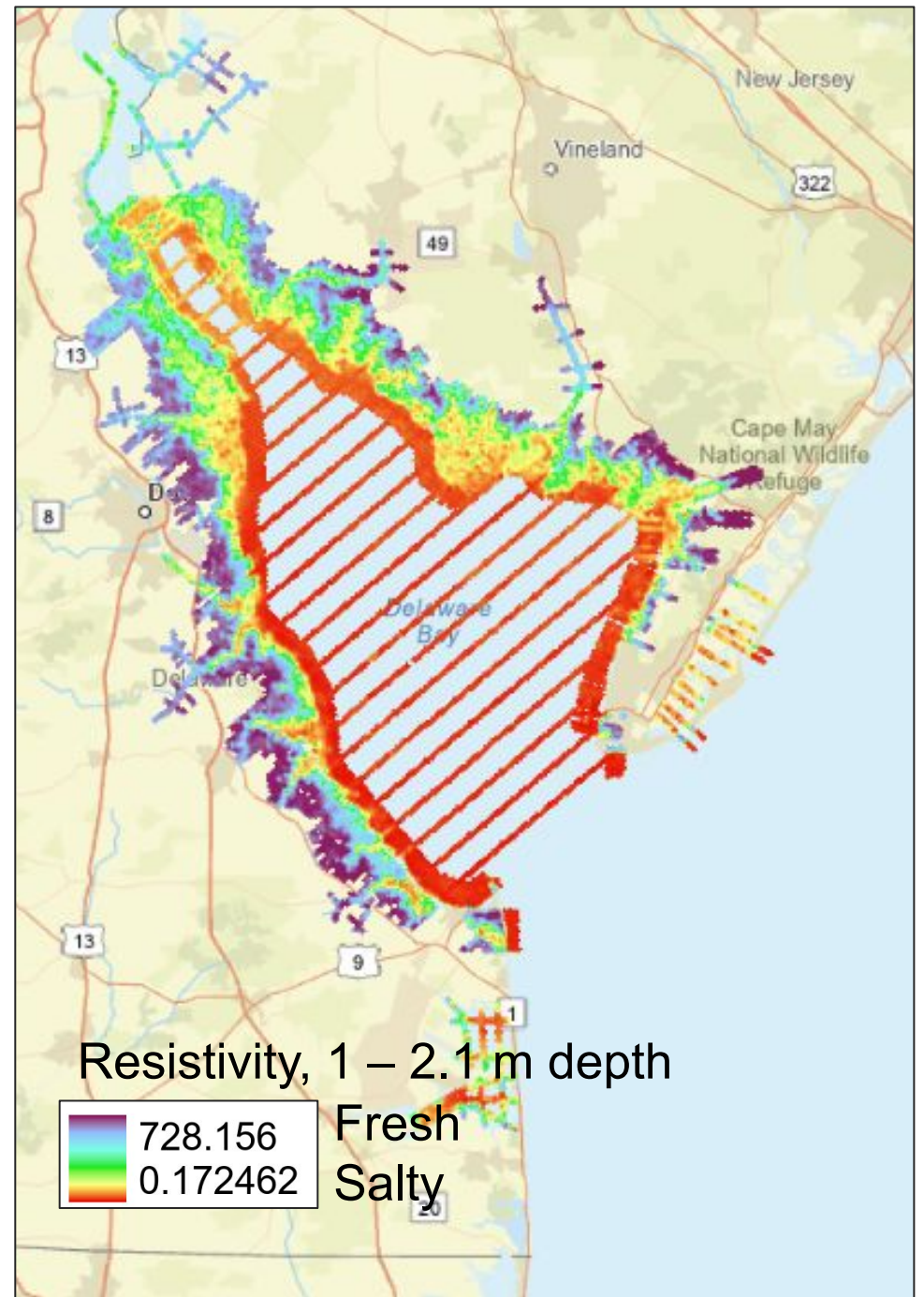
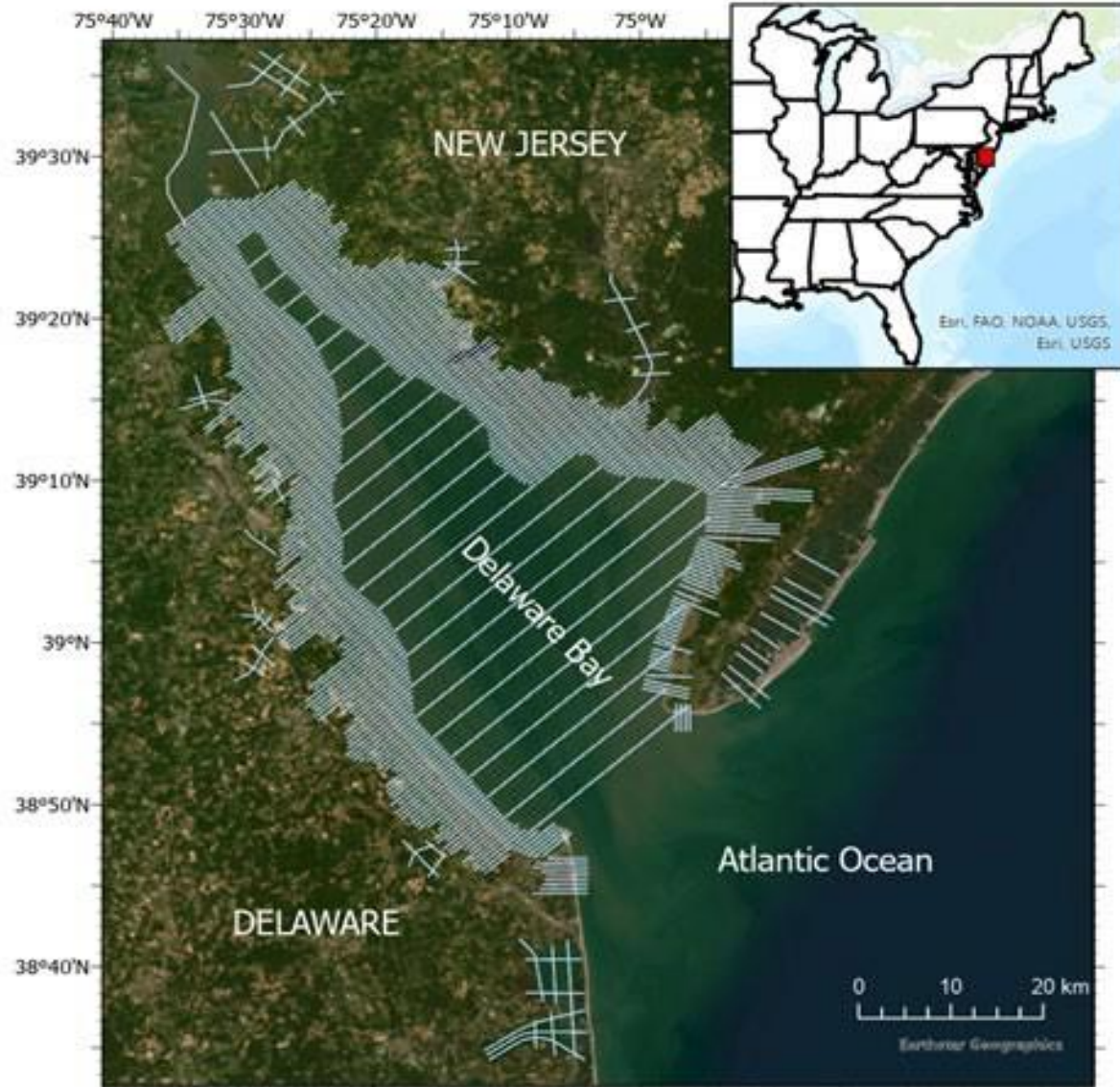


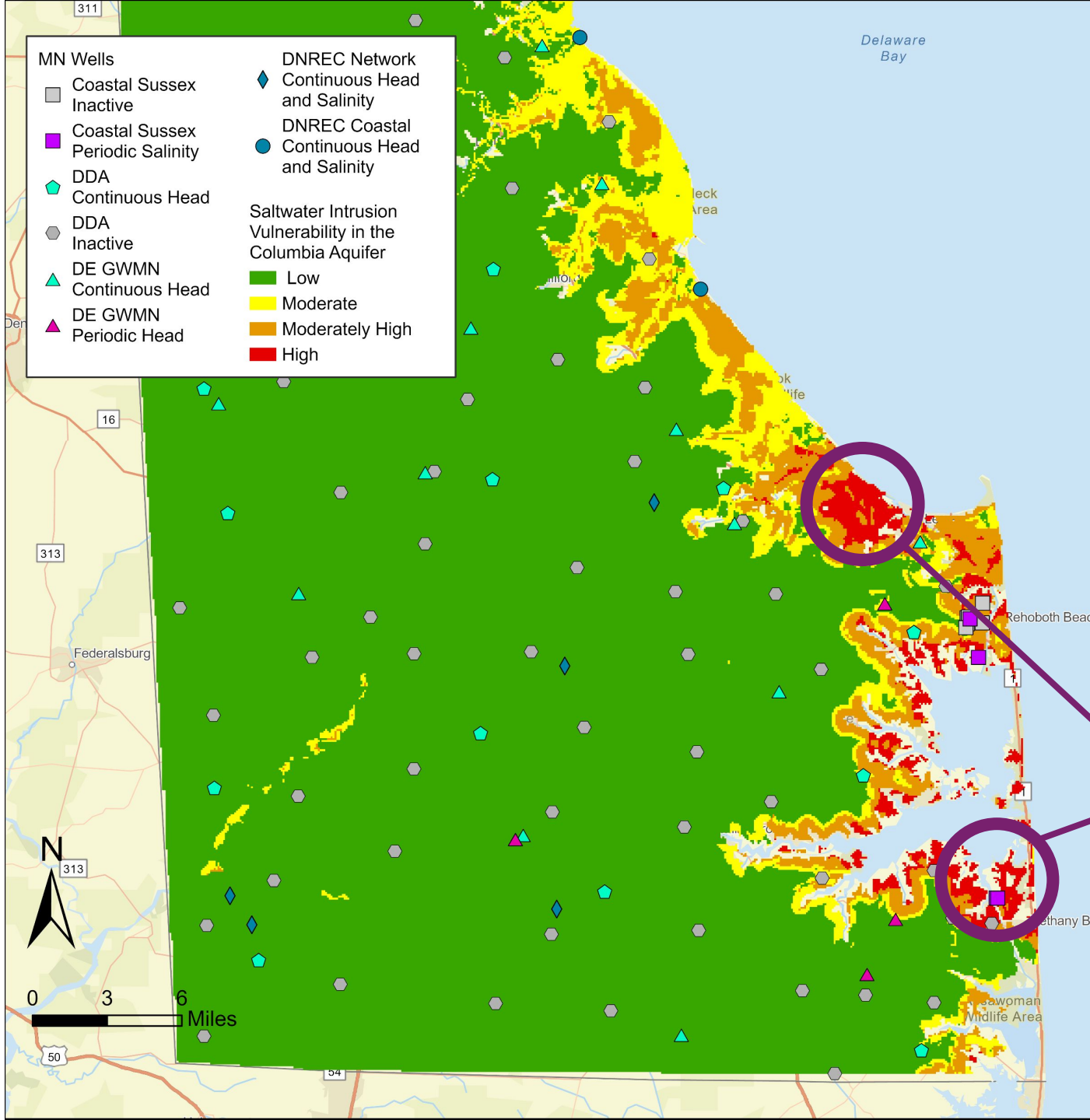
Hydraulic conductivity



Pumping intensity

# AEM survey – USGS, summer 2022





**SWI Vulnerability in the surficial aquifer**  
 Pumping and groundwater level are very important

Potential areas to target for new monitoring wells