New Jersey Coastal Plain: An Example of Ground-Water Monitoring and Management Action

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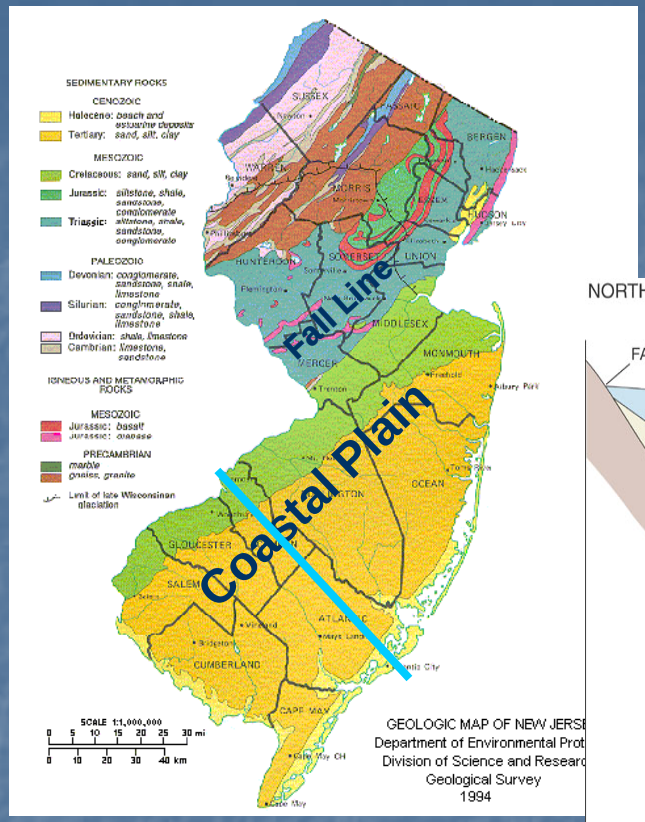
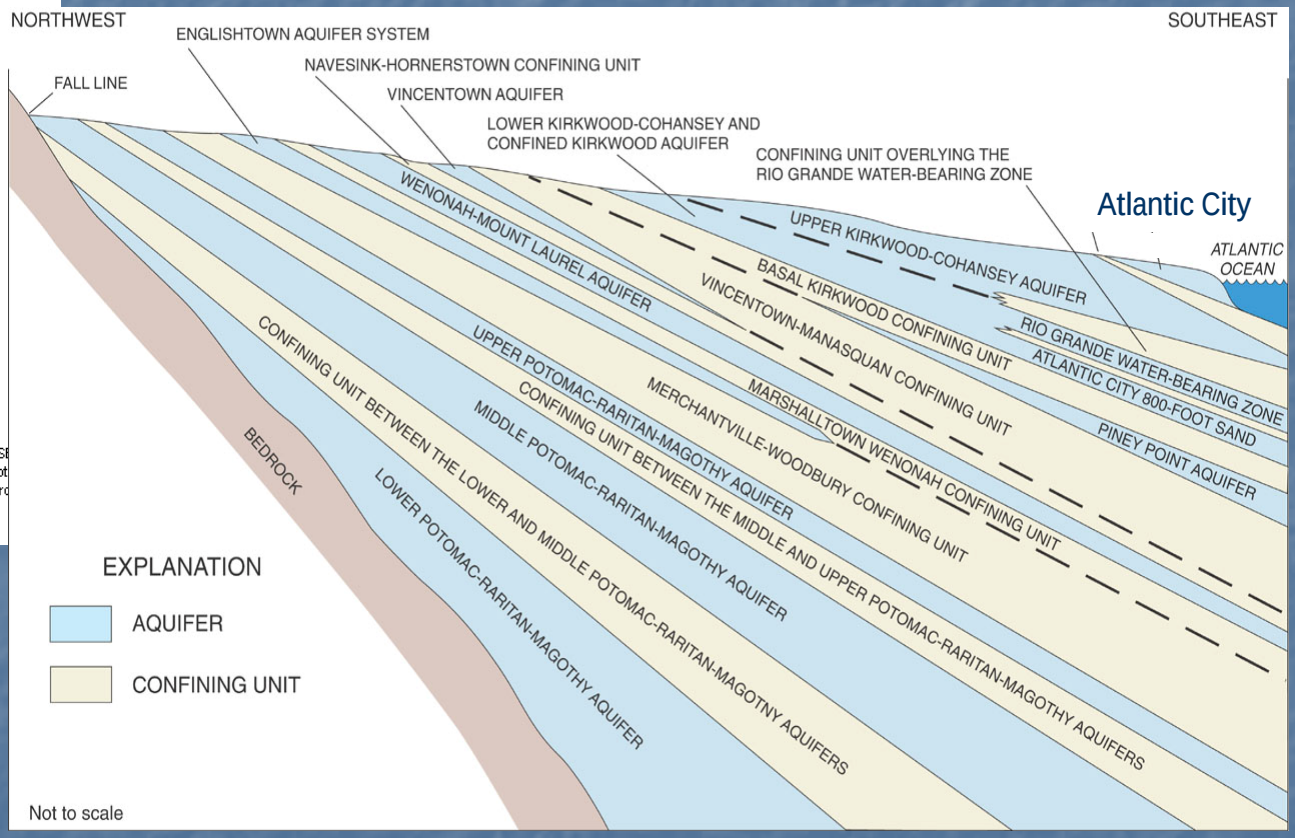
New Jersey Coastal Plain





- Southeast dipping wedge of interbedded sands and clays.
- Ground-Water Use > 425 MGD.

NJ Coastal Plain GW Networks

- Confined Aquifers
  - Continuous Water Levels
  - Synoptic Water Levels
- Water-Table Aquifer
  - Real-Time Water Levels
- Chloride Network
- Baseflow (GW Discharge)
  - Stream Gaging

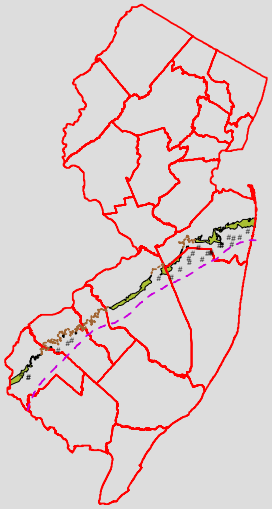
<u>Concerns</u>

- Declining Water Levels
- Well Interference
- Saltwater Intrusion
- Drought
- Stream Baseflow Reduction

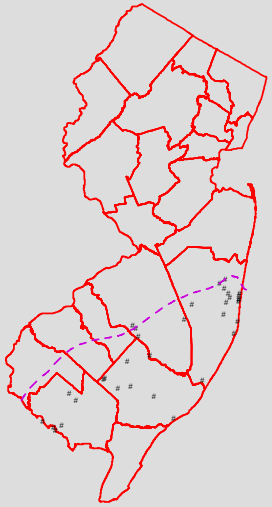
Continuous Monitoring Well Network

- 22 Wells with Real-Time Data Transmission
- 163 Wells with Continuous Recorders
- 54 Manually Measured Wells (meas. 2-6 times/yr)

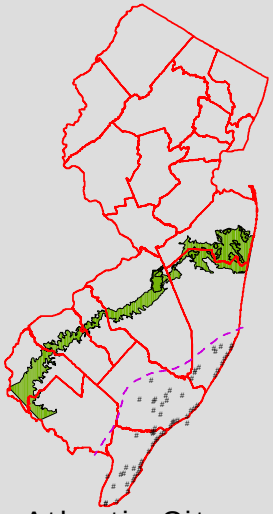
Confined Coastal Plain Aquifers
Synoptic Water-Level Network



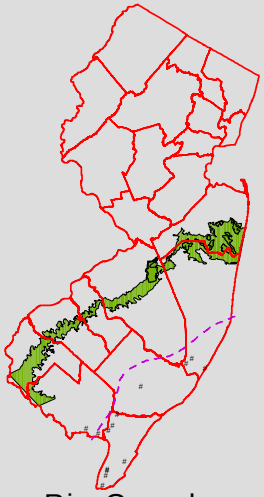
Vincentown Aquifer



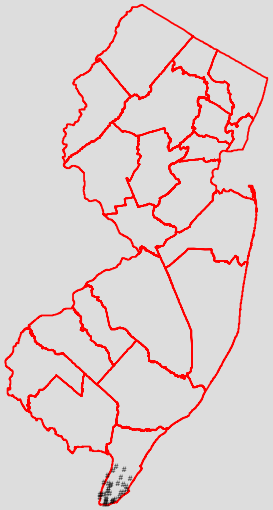
Piney Point Aquifer



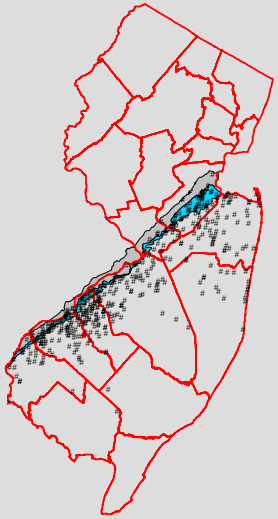
Atlantic City
800-Foot Sand



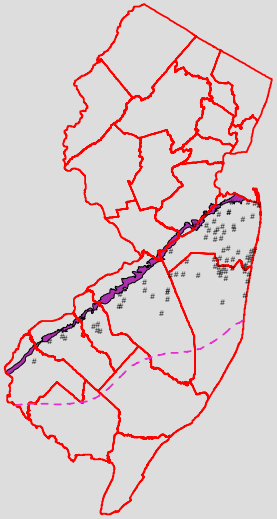
Rio-Grande
Water-Bearing Zone



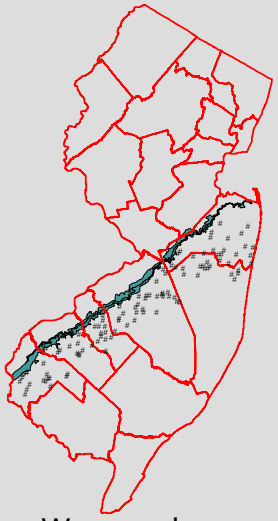
Cohansey Sand



PRM Aquifer System



Englishtown Aquifer

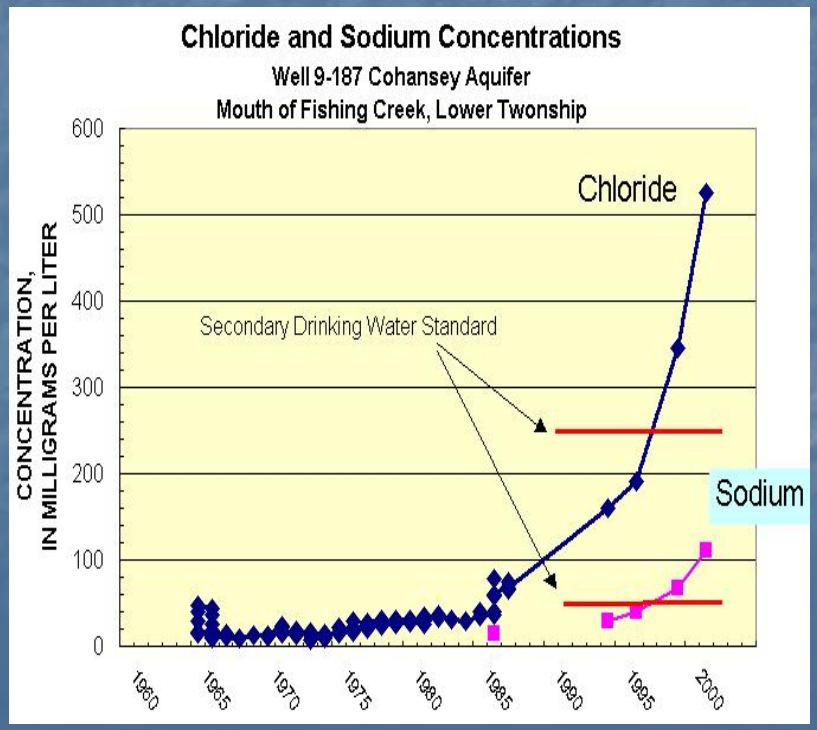


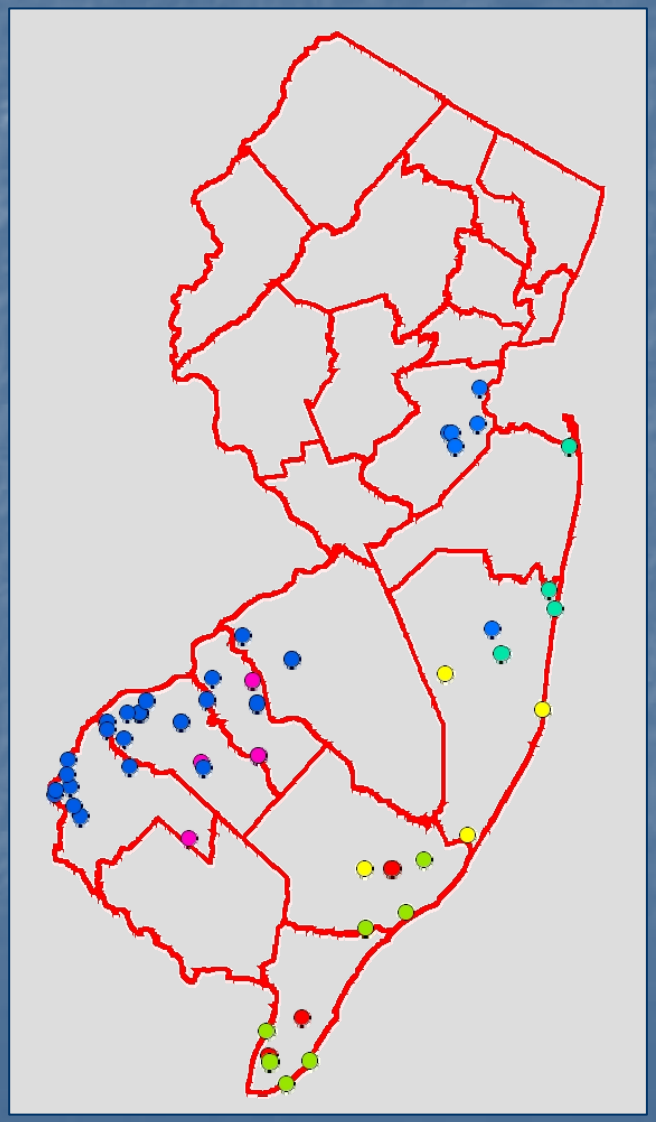
Wenonah-
Mt. Laurel Aquifer

- Cooperative NJDEP/USGS project.
- Major confined aquifers.
- ~750 wells measured in 6 wks.
- Every 5 years since 1978. Next 2008.
- Fall season (medium to low water).
- PA & DE data guide contours at boundary.
- DGS collects data in DE.

Chloride Network

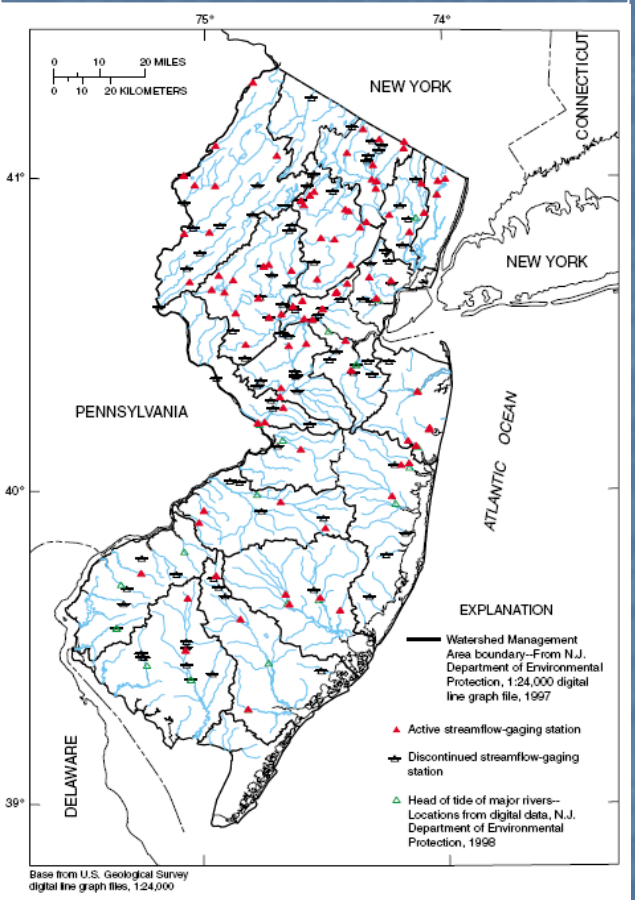
- Periodic chloride measurements to assess saltwater intrusion
  - Active intrusion
  - Deep, old ground water



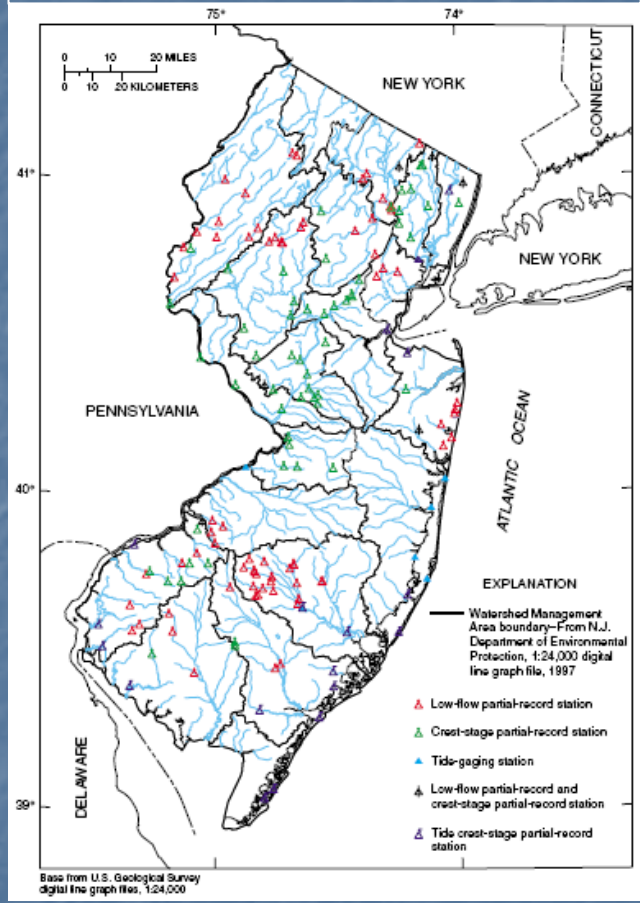


Stream Gaging Network

Continuous Gages



Partial-Record Gages

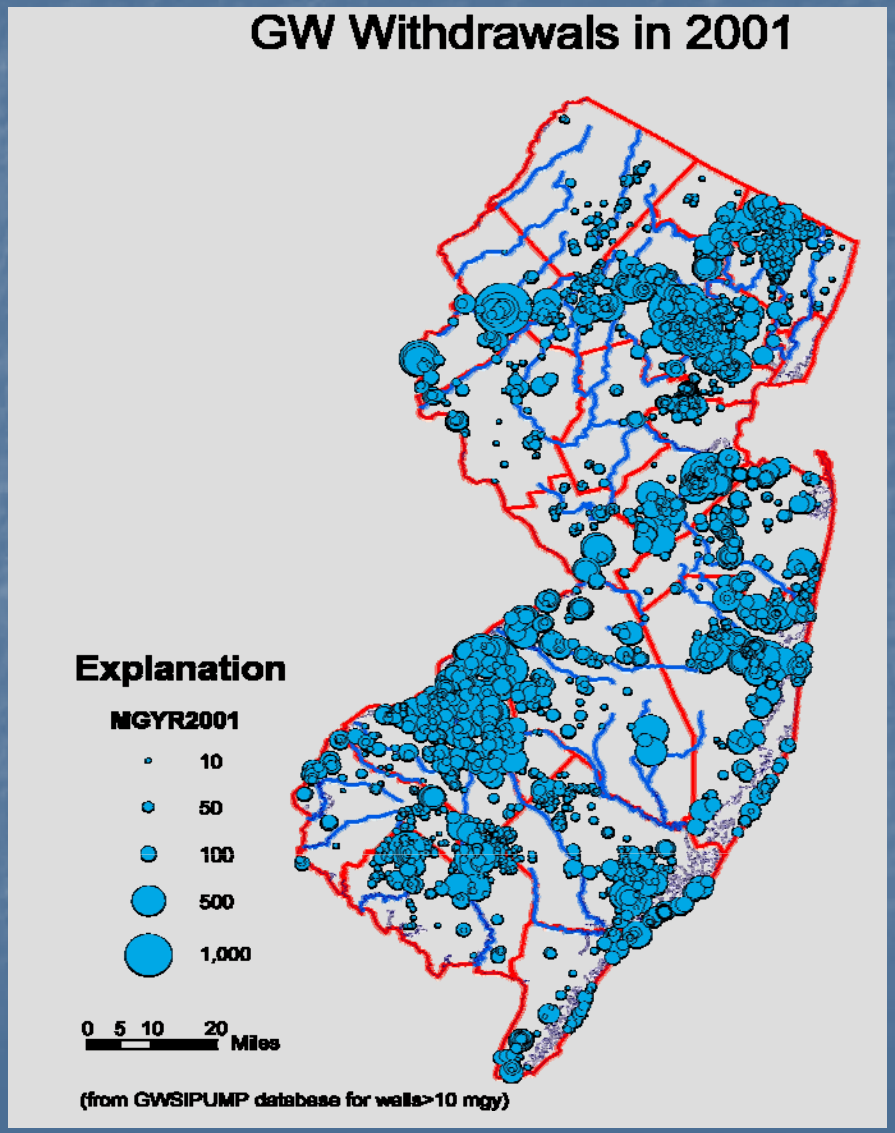


- Baseflow for GW Discharge; integration of effects on Shallow GW.
- Partial record stations supplement continuous records.

Relevant Regulatory Data

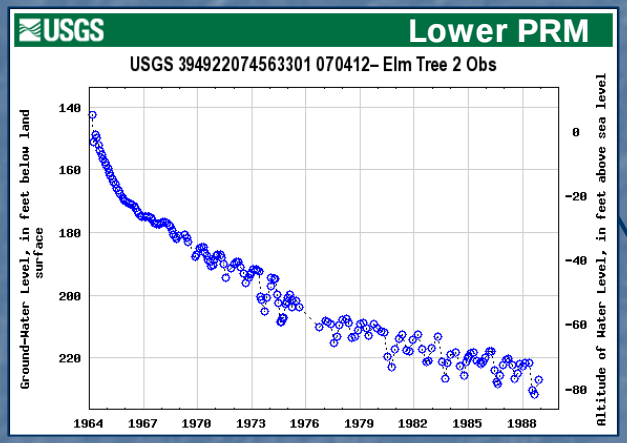
Water Use

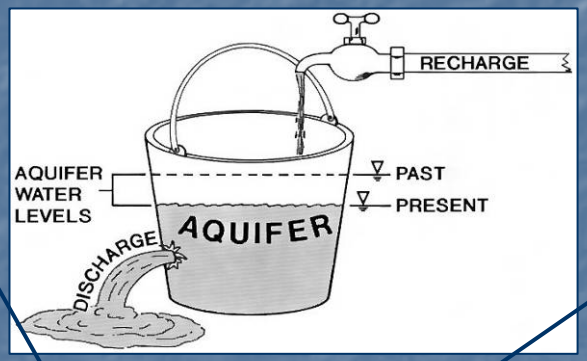
- Understanding nature of significant hydrologic stress.
- Reporting required under NJDEP Permit Program.
  - >100,000 GPD.

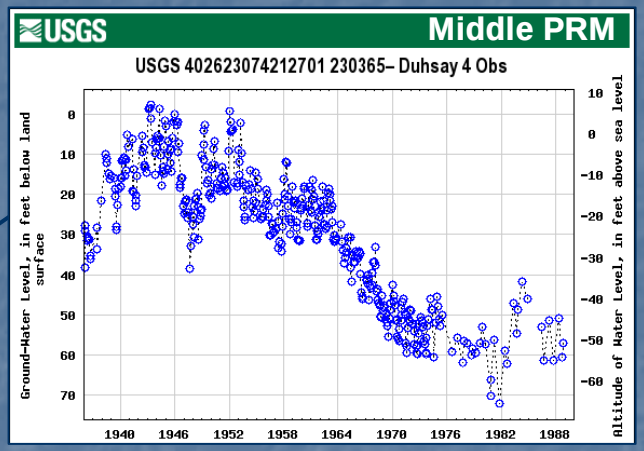


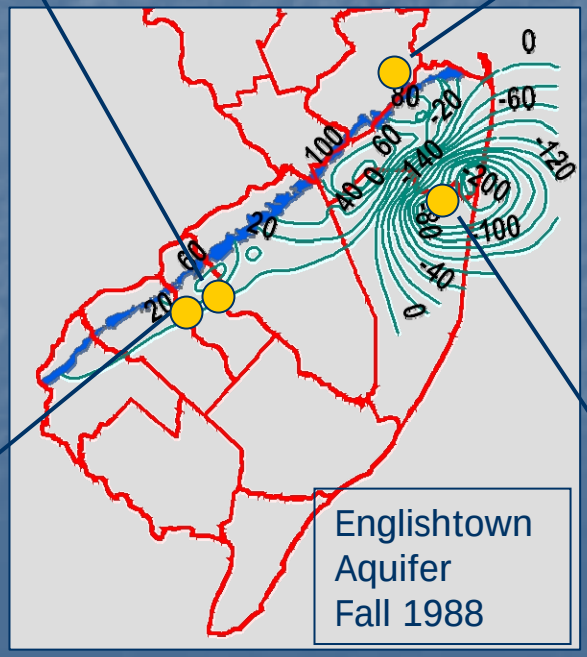
1980's

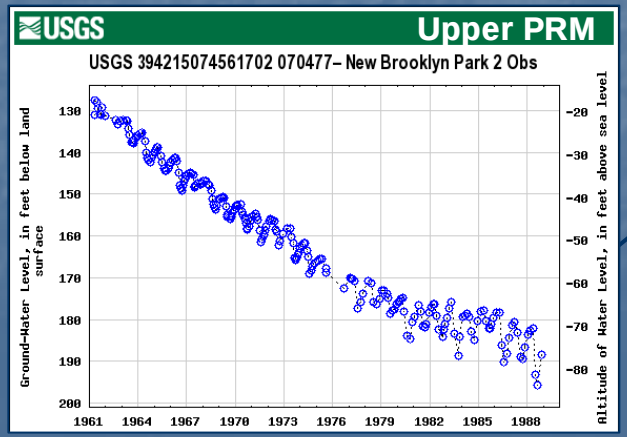
- Concern about continuously declining ground-water levels.
- Proximity to saltwater.

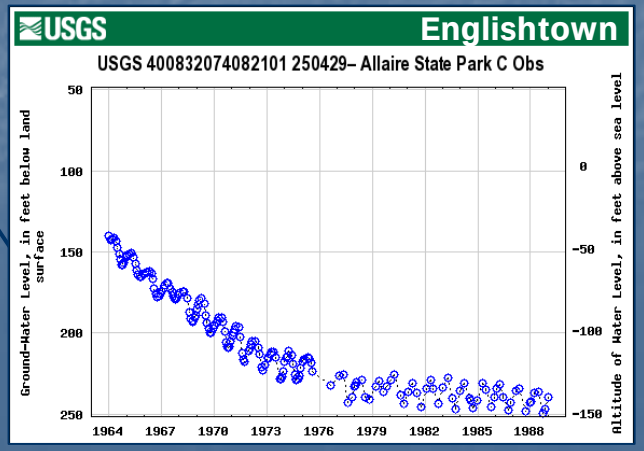






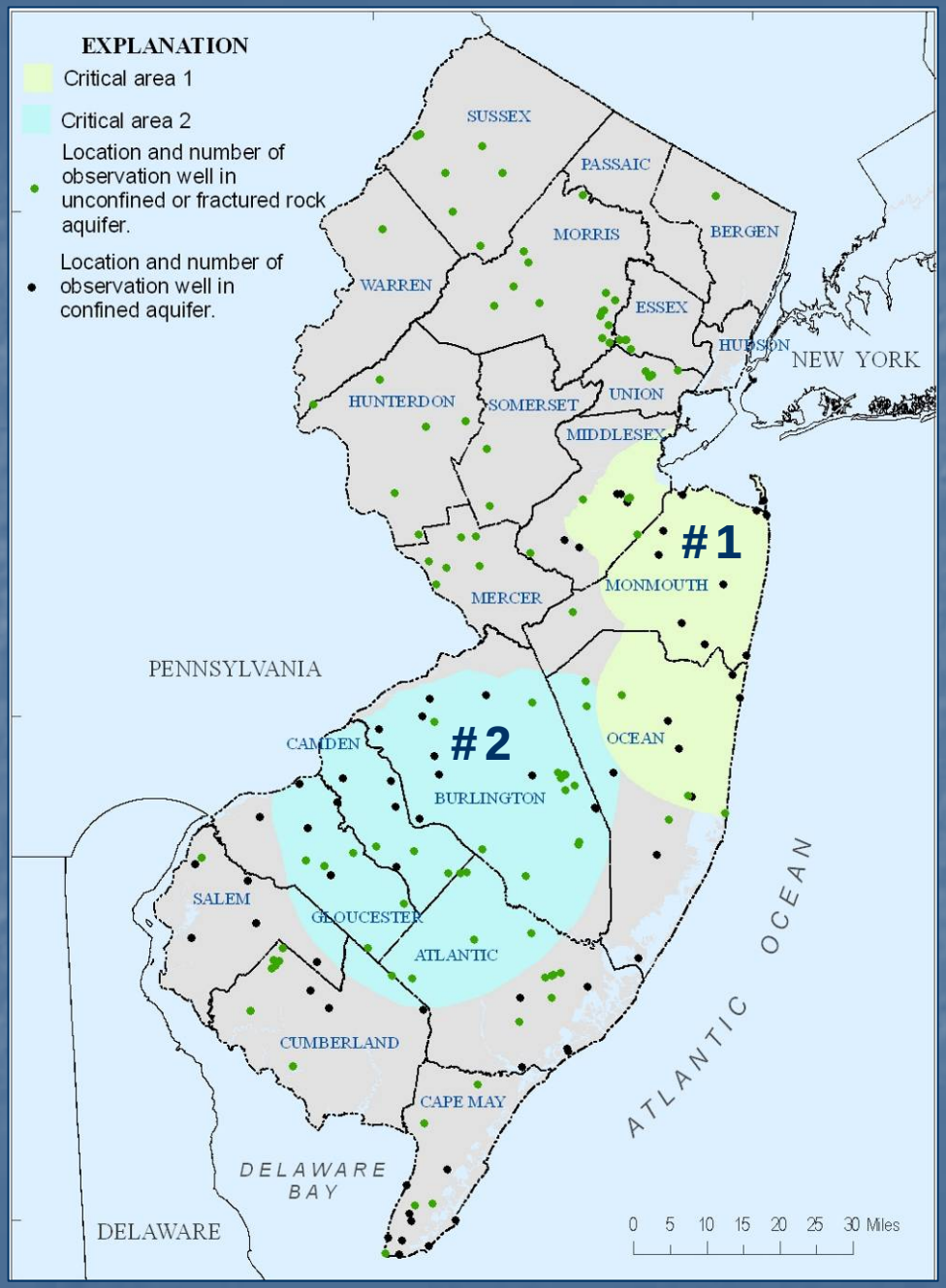






Water-Supply Critical Areas

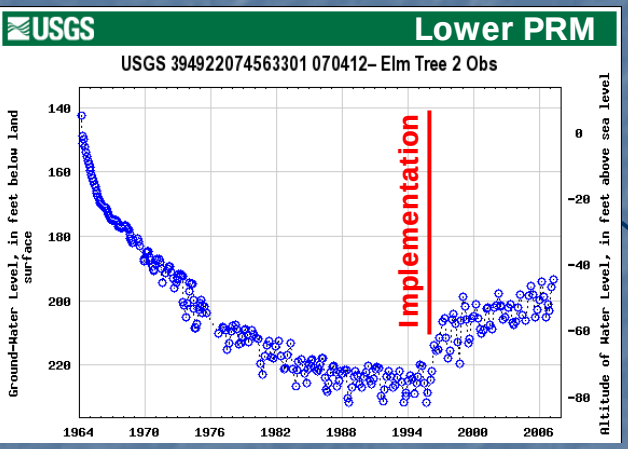
- NJ Statute.
  (Water Supply Management Act 58:1A-7c.)
  - Below –30 MSL
  - Near saltwater
- Admin by NJDEP.
- Use directed to other sources (surface water).
- Restrict future increases.
- 2 areas established:
  #1: 50% reduction in PRM, EGLS, MLRW.
  #2: 22% reduction in PRM.

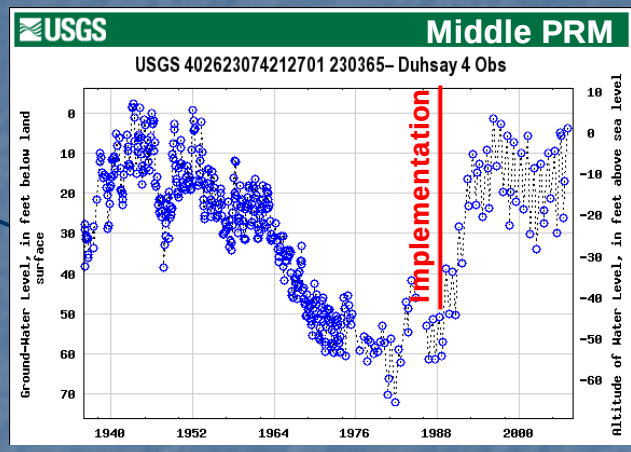


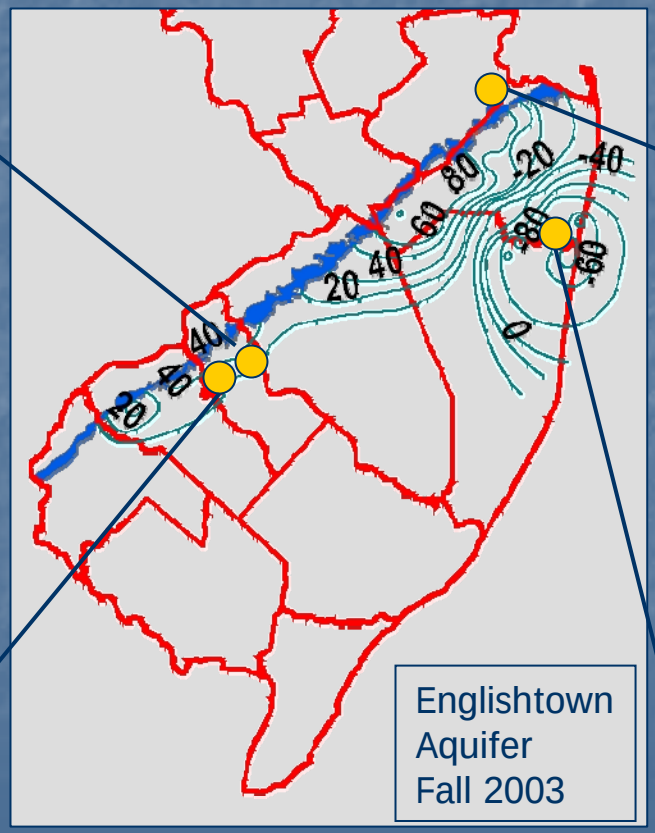
Current (2003) Conditions

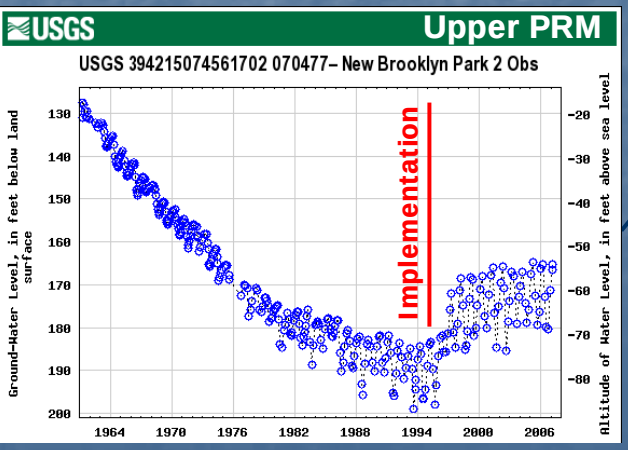
- Critical Areas Implemented.
- Monster Cones of Depression??

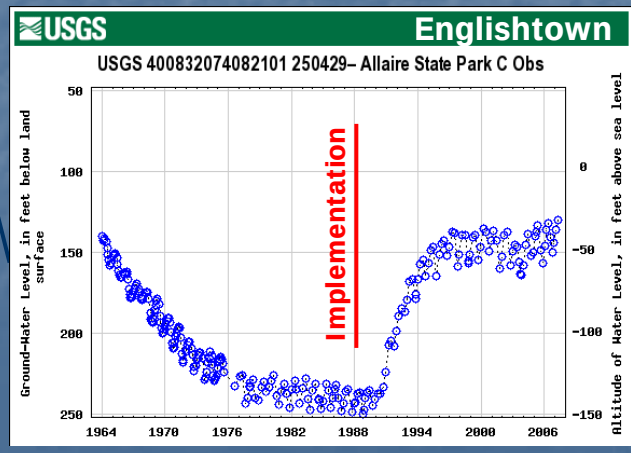
Fogetaboutit!



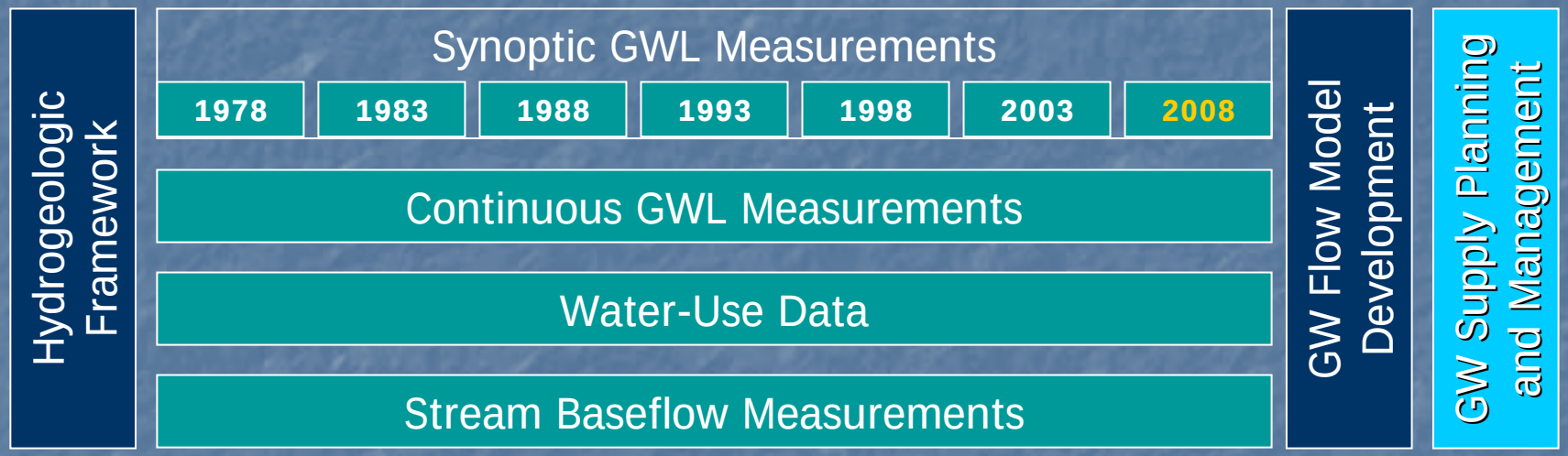






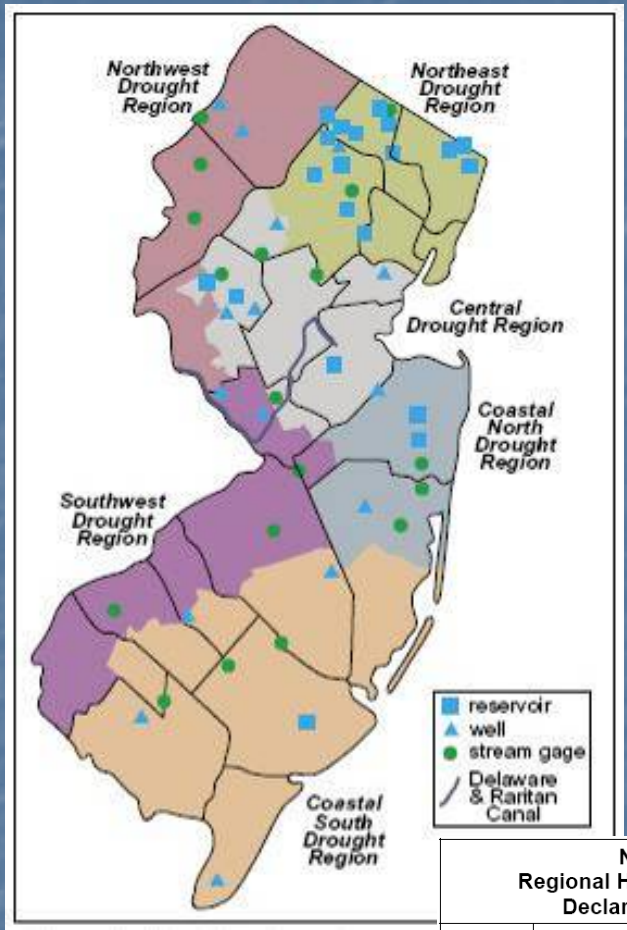


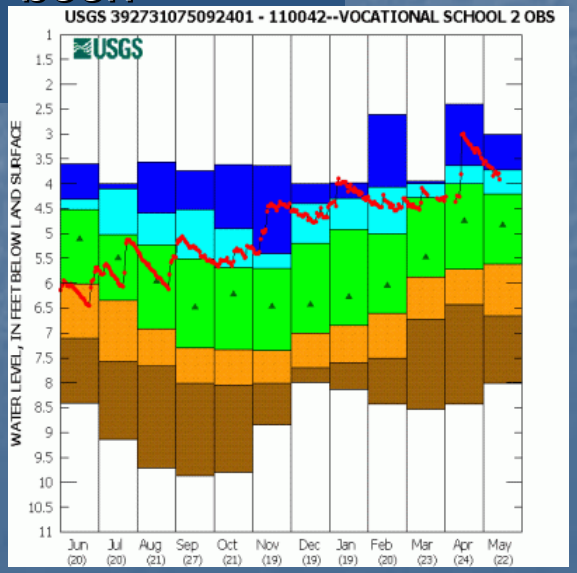
Role of Monitoring in Developing Tools to Assist Water-Supply Management



Drought Network

(Water-Table Wells)



- "Emergency" requires cutbacks.
- 6 Drought Regions Designated.
- Indicators:
  - Precipitation
  - Streamflow
  - Ground-Water Levels
  - Reservoir Levels
- Past Emergencies have been declared statewide.

NEW JERSEY Regional Hydrologic Indicators & Declared Drought Status							May 2, 2007		
Region	Indicator Status	Hydrologic Indicator						Drought Status	
		90-day precip-itation	90-day stream flow	NJ res.	Del R. res.	Unconf. ground water			
Coastal North	Near or above normal	2	43	6	Not a significant water source to the region	34		Normal	43
	Moderately dry							Watch	
	Severely dry							Warning	
	Extremely dry							Emergency