

# Managing Water Resources in New Jersey: An Overview

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# A Regulatory Perspective



# Overview of Today's Discussion

- Background
  - Division Organization
  - Water Allocation Permitting Decision Process and Information Needs
  - Closing
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# Background

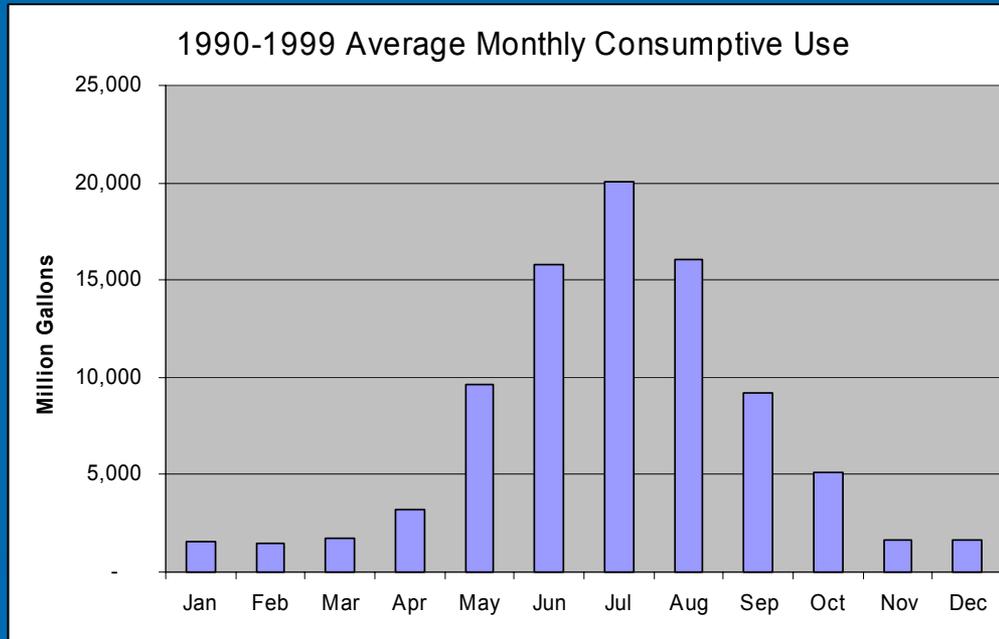
- New Jersey: Water Rich or Limited Resource State?
  - Average Statewide Precipitation: Approx. 45 inches
  - Over the past 11 years, we've had statewide or regional drought actions declared in 1993, '95, '99, '02

# Water Demand

- Statewide Annual Water Use:
- Approx One Trillion Gallons per year
  - Decreased by 8% or 80 billion gallons (1990-99)
    - 💧 Reductions due to reductions in power generation and industrial uses
  - Consumptive water use increased by 14% or 11 billion gallons
    - 💧 Irrigation (e.g. golf courses, corporate complexes, etc)
    - 💧 Substantial monthly variations



# Preliminary Results



# NJ Water Supply Management Act

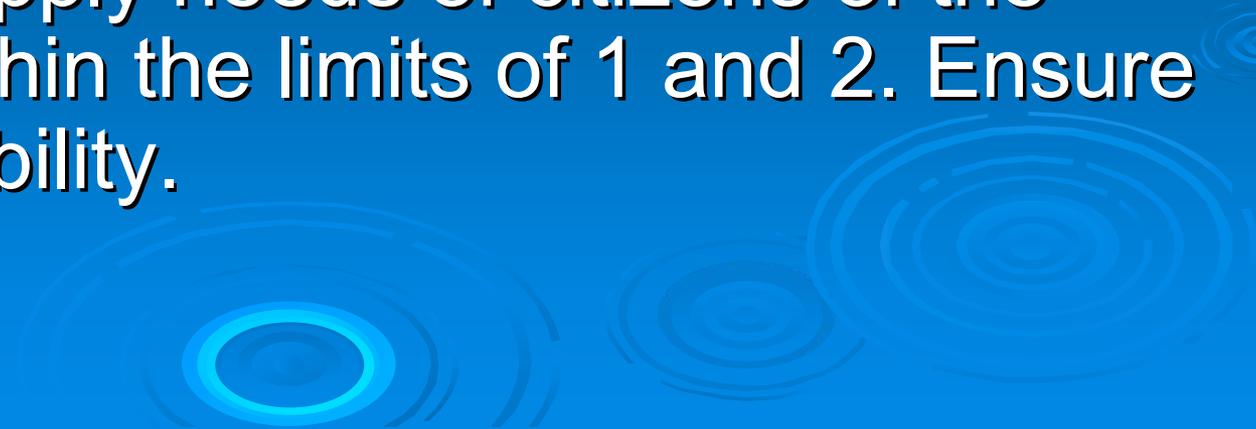
## N.J.S.A. 58:1A

- The Legislature finds and declares that the water resources of the State are:
  - public assets of the State
  - held in trust for its citizens
  - essential to the health, safety, economic welfare, recreational and aesthetic enjoyment, and general welfare of the people of New Jersey

# NJ Water Supply Management Act (cont'd)

- Need to ensure
  - an adequate supply and quality of water for citizens of the state, both present and future, and
  - to protect the natural environment of the waterways of the State
- DEP shall adopt
  - a water diversion permit system,
  - a monitoring inspection and enforcement program,
  - a program to study and manage the State's water resources and plan for emergencies and future water needs, and
  - regulations to manage the waters of the State during water supply and water quality emergencies.

# Goals: Division of Water Supply

1. Protect public health: ensure delivery of water that meets Safe Drinking Water Standards
  2. Protect water resources and water resource-dependent species
  3. Provide adequate water to satisfy the water supply needs of citizens of the State within the limits of 1 and 2. Ensure sustainability.
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# Division of Water Supply

- 120 people
- \$13 Million Budget
  - State Appropriations (includes permit fees)
  - Water Supply Bond Fund
  - Safe Drinking Water: A-280 (tax) and Federal
  - Private Well Testing Act

# Organization

## ➤ Water Supply Operations

- Safe Drinking Water Standards (MCLs)
- Safe Drinking Water Compliance
- DW State Revolving Fund Program (DWSRF)
  - Loan program to support drinking water projects
- Private Well Testing Act Program
  - Well testing at the time of real estate transfer
- Source Water Assessment Program
- Water System Security
- Computer system support (Federal and State)

# Organization (cont'd)

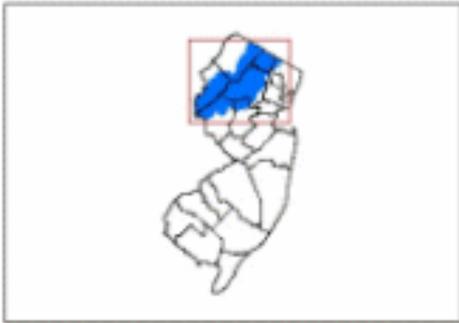
## ➤ Water Supply Permitting

- Water Allocations
  - Diversions >100,000 gpd; >50,000 gpd in the Highlands
  - Water Use Registrations (register if capable of pumping limits)
  - Agricultural Certifications (>100,000 gpd)
  - Water Supply Contract Reviews
  - Critical Areas Management
- Well Permitting (proper construction of wells)
- Safe Drinking Water Permits
  - Water main extensions
  - Public Water Systems – Community and Non-community (approx. 4,500 public systems)
  - Wells and Treatment
- Drought Monitoring
- Interstate Water Supply Issues (DRBC and NY/NJ issues)

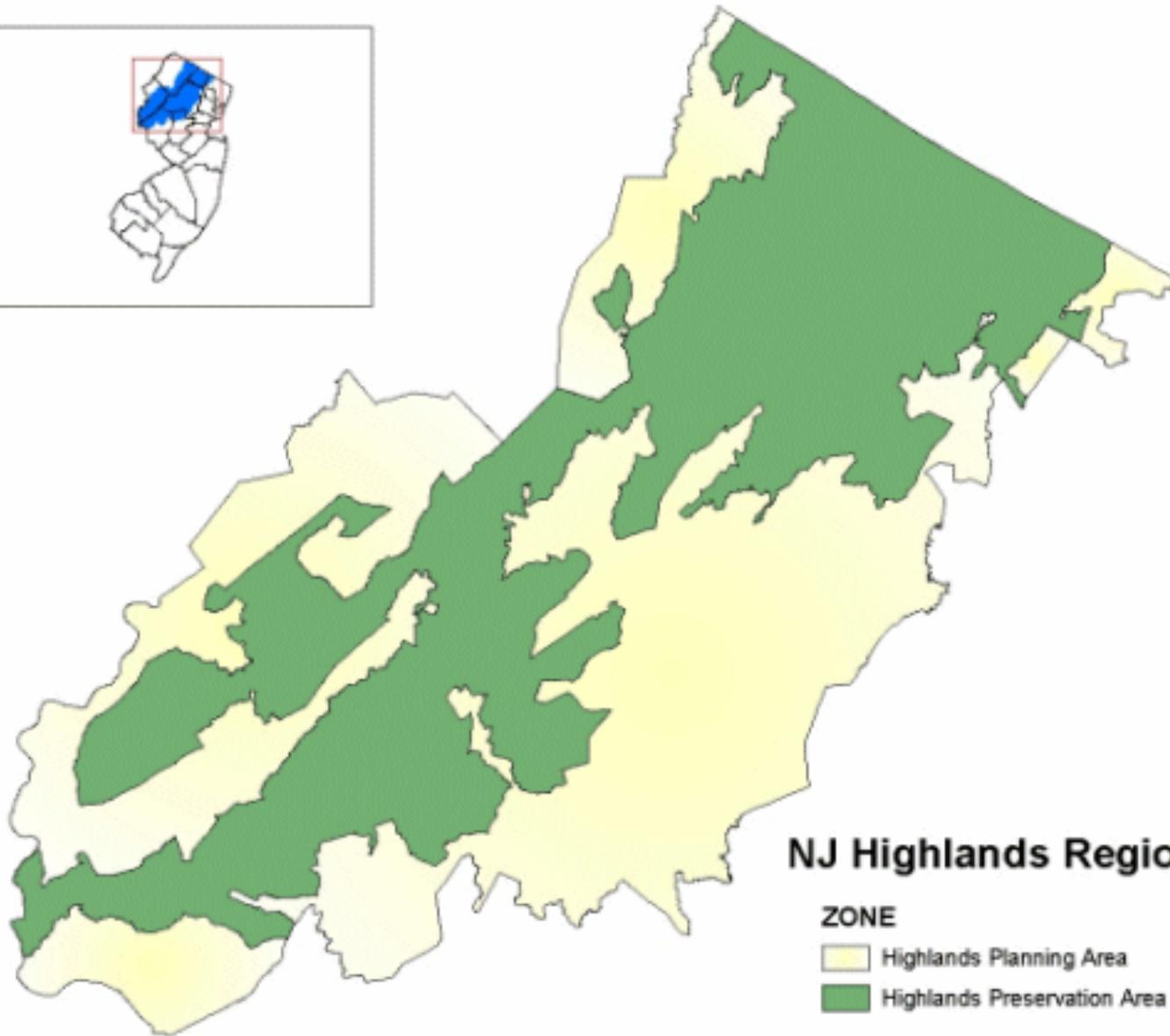
# Water Allocation Permit Decisions

1. **Is the proposed diversion in the public interest?**
    - Historically:
      - Sign-off from Township/consistent with Master Plan, etc.
      - General demand estimates
    - Now:
      - Consistency with SDW demand projections.
      - How will the water be used? Potable vs. non-potable use
      - What area will it serve? Highlands, Smart Growth, etc.
      - Are there other available alternative sources?
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- The background of the slide features several concentric, glowing blue circles that resemble ripples on water, positioned in the lower right and bottom center areas.

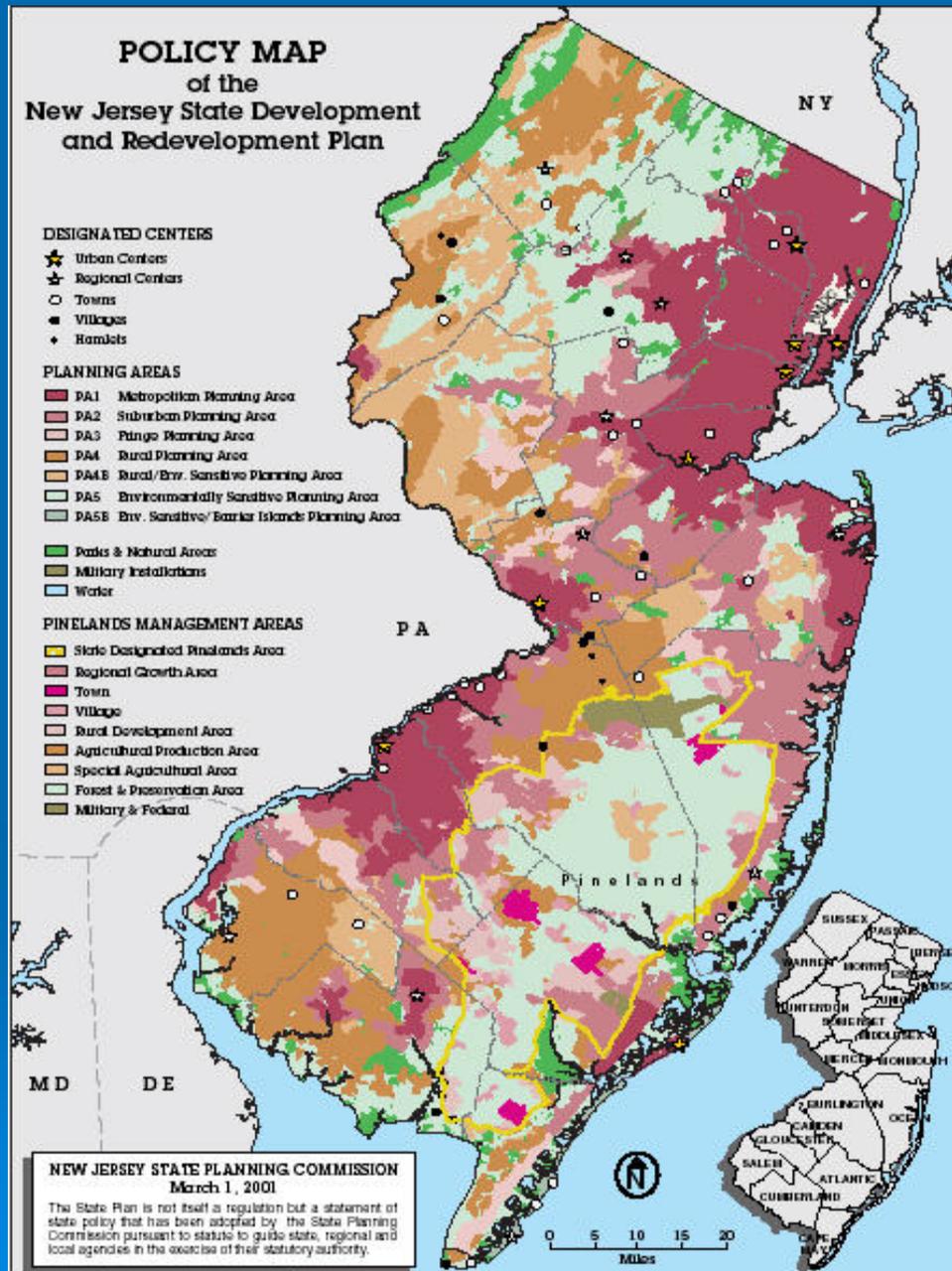
# New Jersey Highlands Preservation and Planning Area



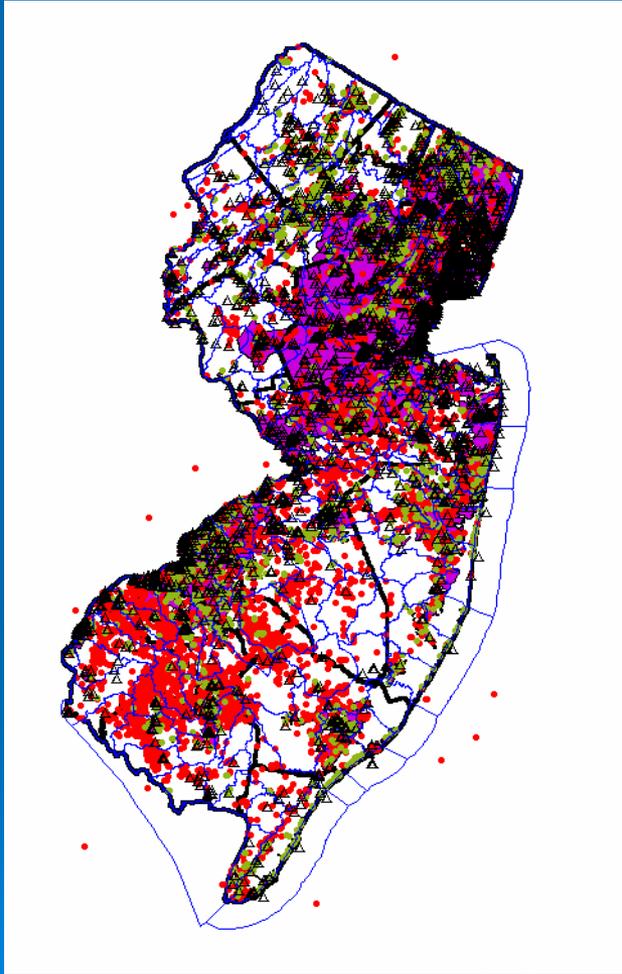
Prohibit  
PWS's  
In HPA



# Support Water Supply In Smart Growth Areas



## 2. Does the diversion adversely affect other users?

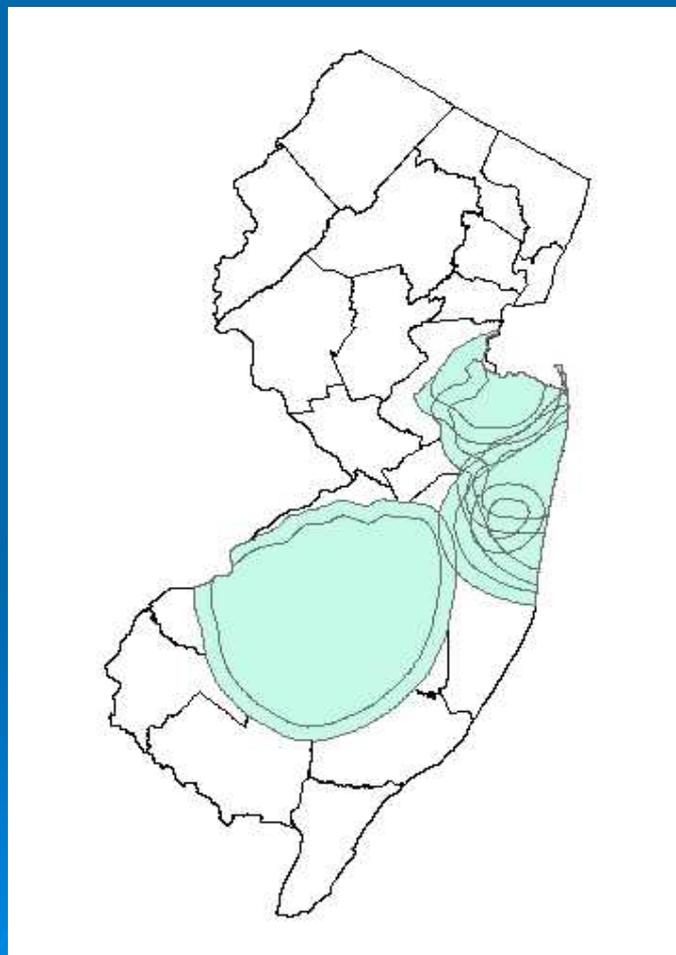


- >600 Community Water Systems
- >3,500 Non-community water systems
- Approx. 250,000 Domestic wells (1 Million People Served)

### 3. Is the proposed diversion located within a Critical Area?

- N.J.S.A. 58:1A-6 and N.J.A.C. 7:19-8.2:
  - The Commissioner may designate an area of critical water supply concern where we demonstrate that the area is stressed to a degree which jeopardizes the integrity and viability of the water supply source or poses a threat to public health, safety and welfare.
  - Drawdown and salt line
- No new or increased diversions in CA 1 or CA 2.

# Two Critical Areas Identified in NJ



# Critical Areas

- Models showing recovery of Critical Area aquifers
- Analysis ongoing to determine where, if anywhere, we can locate new diversions, return previous uses and to what extent.



# 4. Will the proposed diversion cause an increase in saline intrusions that renders the resource unfit for use?

## Cape May County :“Gibson Bill”:

- **Allocations Will Not:**
  - **Accelerate Saltwater Intrusion**
  - **Have Significant Stream Base Flow/Ecological Impacts**





## 5. Will the proposed diversion spread ground water contamination?

- Known contaminated sites >15,000
  - Classification Exception Areas (CEA): one or more contaminants in the groundwater exceeds the GWQS from a known source; restrictions on water use based on contaminants
  - Currently Known Extent (CKE): one or more contaminants in gw exceeds GWQS from an unknown source; restrictions on water use based on current knowledge of contamination

Known  
Contaminated  
Sites 2001

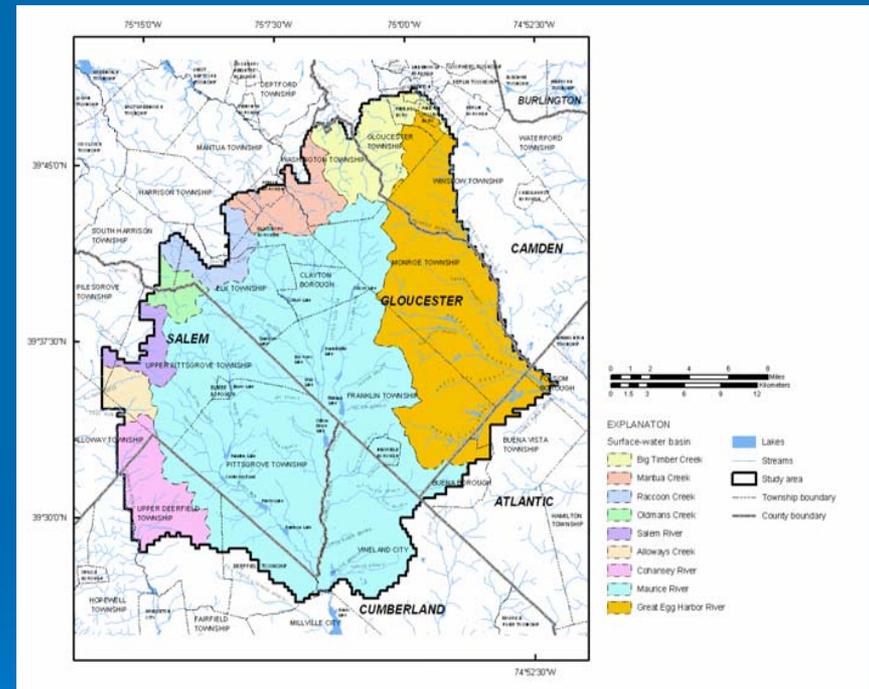


## 6. Will the diversion exceed the natural replenishment or safe yield of the water resource or threaten to render them unfit for future use?

- Safe Yield: Sustainable yield from a surface or ground water source available continuously during projected future conditions, including a repeat of the drought of record, without creating “undesirable effects”.

# Example: Upper Maurice River Basin

- **Diverting At Current Approved Allocations May Result In Loss Of Stream Flow Under Drought Conditions**
- **Cohansey & Surface Water Diversions Requests Affected**

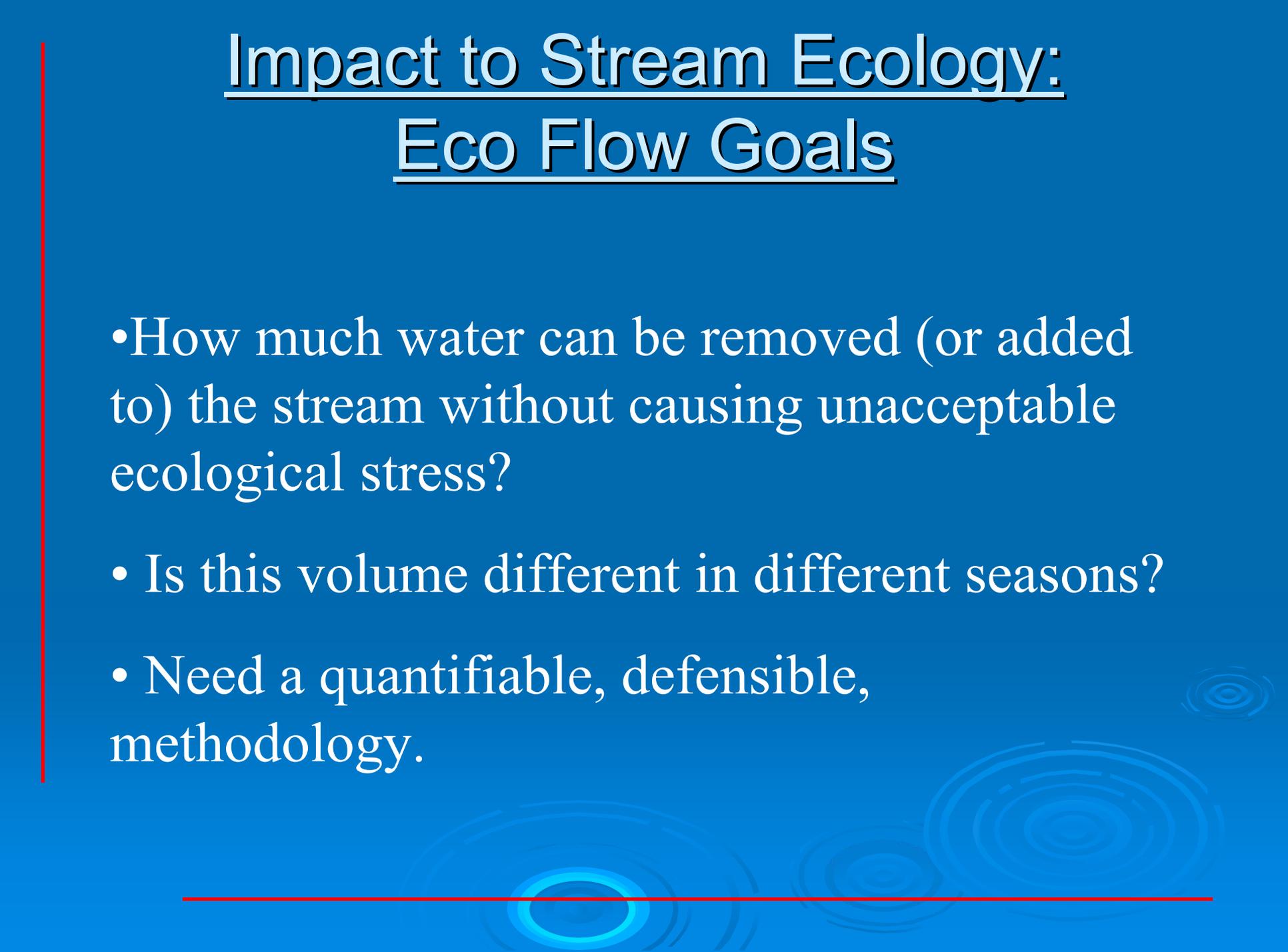


## 7. Will the proposed diversion impact wetlands or T & E habitat?

- Water allocation rules prohibit location of a structure within a State designated freshwater wetland or transition area wetlands
- Wetlands rules require evaluation of impacts and prohibit if there is an available alternative
- Assessing T& E habitat impacts



# Impact to Stream Ecology: Eco Flow Goals

- How much water can be removed (or added to) the stream without causing unacceptable ecological stress?
  - Is this volume different in different seasons?
  - Need a quantifiable, defensible, methodology.
- 

# Instream Flow Needs of ...



dragonflies &  
other insects



shad & other fish



*Photo by Jayne Brim Box, USGS,  
FCSC, Gainesville, FL*

freshwater mussels



periphyton



T&E species



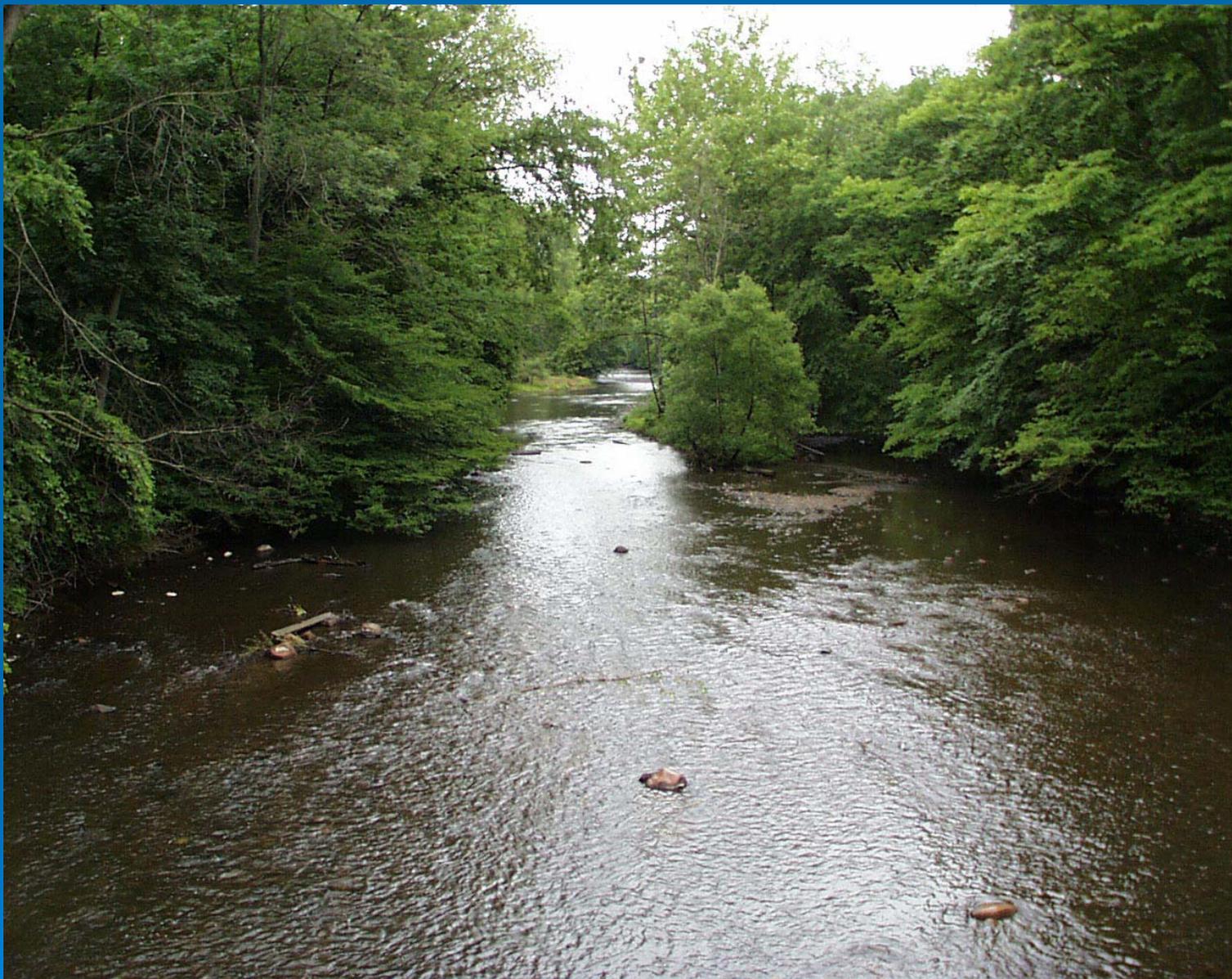
reptiles &  
amphibians

- But, we don't have accurate, life-cycle specific, flow-health relationships for any species.
- Have lots of good data on trout but optimal conditions for trout may be suboptimal for other species.
- Have 7Q10 flows: quantifiable, easy to apply, clear, but only protects low end of flow, and does not consider timing

# Realizations

- Current ecosystem evolved under a set of conditions.
- Flows naturally are lower than median half of the time, higher the other half.
- Natural species have evolved in response to variation in flows.
- Changes in natural variation will challenge ecological integrity.

A  
V  
E  
R  
A  
G  
E



June 1999

D  
R  
O  
U  
G  
H  
T



South Branch Raritan, Grey Rock Rd. Overpass,  
Clinton Twp, Hunterdon Co., August 1999

F  
L  
O  
O  
D



After Hurricane Floyd, September 1999

# Where we are:

- No existing methodology to correlate stream flows with ecological health of all species.
- Need to protect full range of stream flow and dynamics to protect full ecosystem.
- Natural variability approach promising; potential to be much more protective of stream ecology
- Implementation issues:
  - How do we factor in safe yield of other users?
  - How do we manage within a permitting framework, e.g. changing monthly allocation limits and when do they have to shut the pumps off to protect the stream?
  - How do we enforce the provisions of the permit, i.e. what is the “bottom line”?
  - How do we address areas that may be determined to be “over-allocated”?

## 8. For non-potable requests, did they demonstrate that the water diverted is the “lowest quality water for the intended use”?

- Historically: reuse found to be more expensive, and therefore, “not available”. The “lowest quality water” became the highest quality water.
- Now: requiring maximum reductions in demand for non-potable, highly consumptive purposes, requiring reuse feasibility studies, supporting reuse efforts with grant monies, and conditioning permits to prohibit potable supplies for non-potable purposes.

# Additional Safe Drinking Water Restrictions- Source Water Protection

## ➤ Source Water Assessments

- Determined “Vulnerability” of sources based on location of source, aquifer characteristics, well characteristics, and the distance to various potential contaminant sources

## ➤ Ongoing evaluation of source water protection initiatives

- e.g. Should we prohibit the proposed location of new sources if a major pollutant source is identified within the projected Tier I of a proposed diversion?

**New Jersey  
Ground Water &  
Surface Water  
Source Water Areas (SWAs)**

Pennsylvania

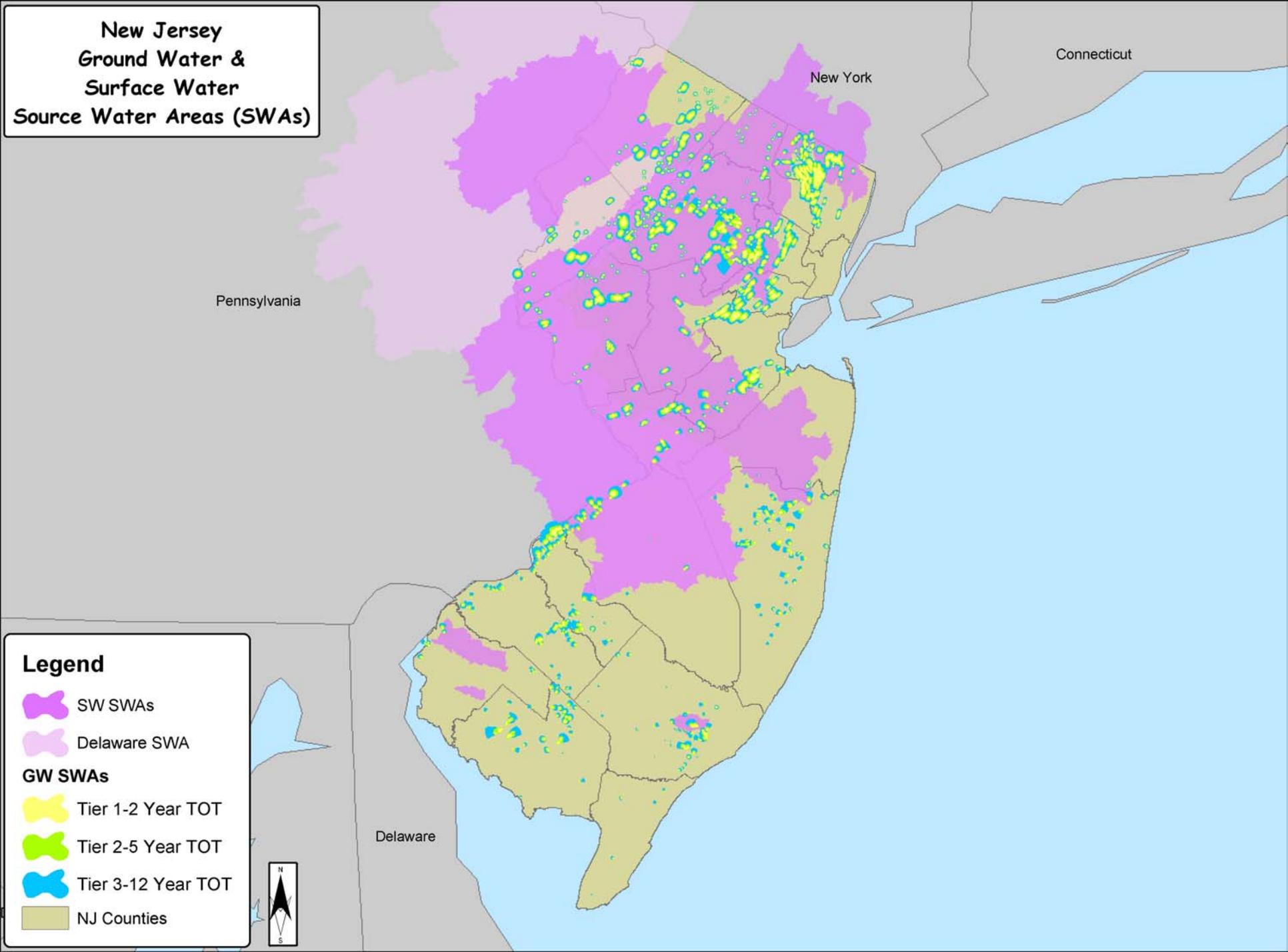
New York

Connecticut

Delaware

**Legend**

-  SW SWAs
-  Delaware SWA
- GW SWAs**
-  Tier 1-2 Year TOT
-  Tier 2-5 Year TOT
-  Tier 3-12 Year TOT
-  NJ Counties



# Water Allocation Permit Denial

- If the applicant fails to demonstrate these or the Department determines there is a more viable alternative source of water available, or if its inconsistent with the NJ Statewide Water Supply Plan, the Department may deny the permit.

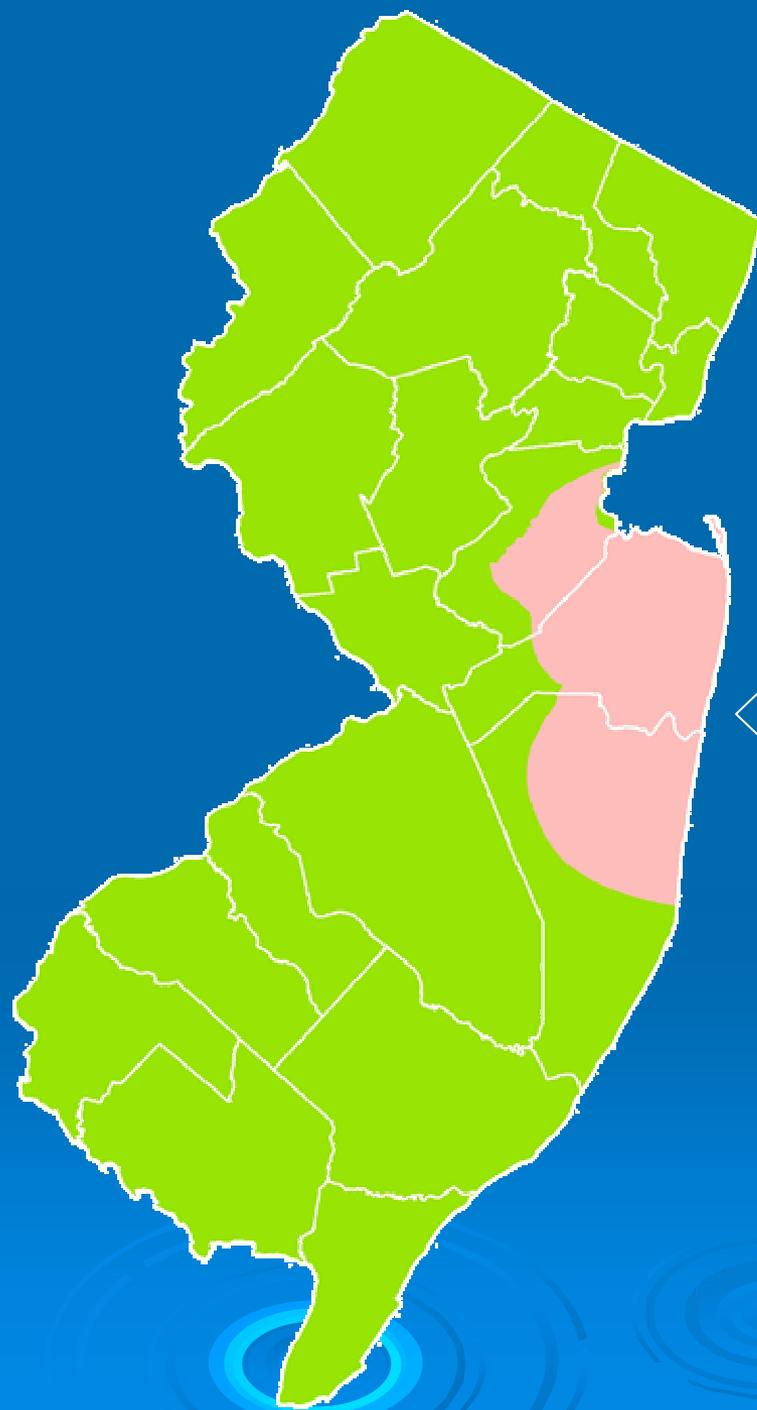


# SUMMARY

Summary of the factors considered when making allocation permit decisions.....

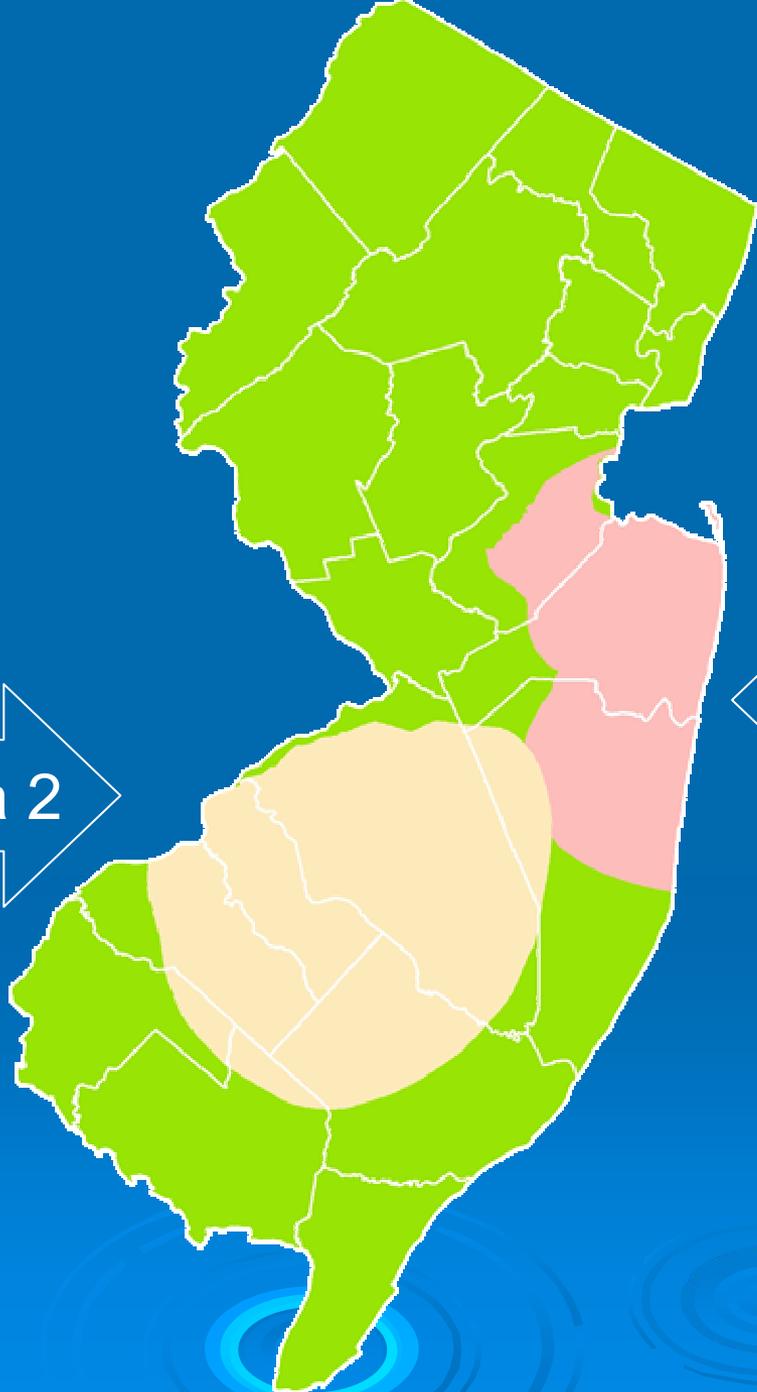




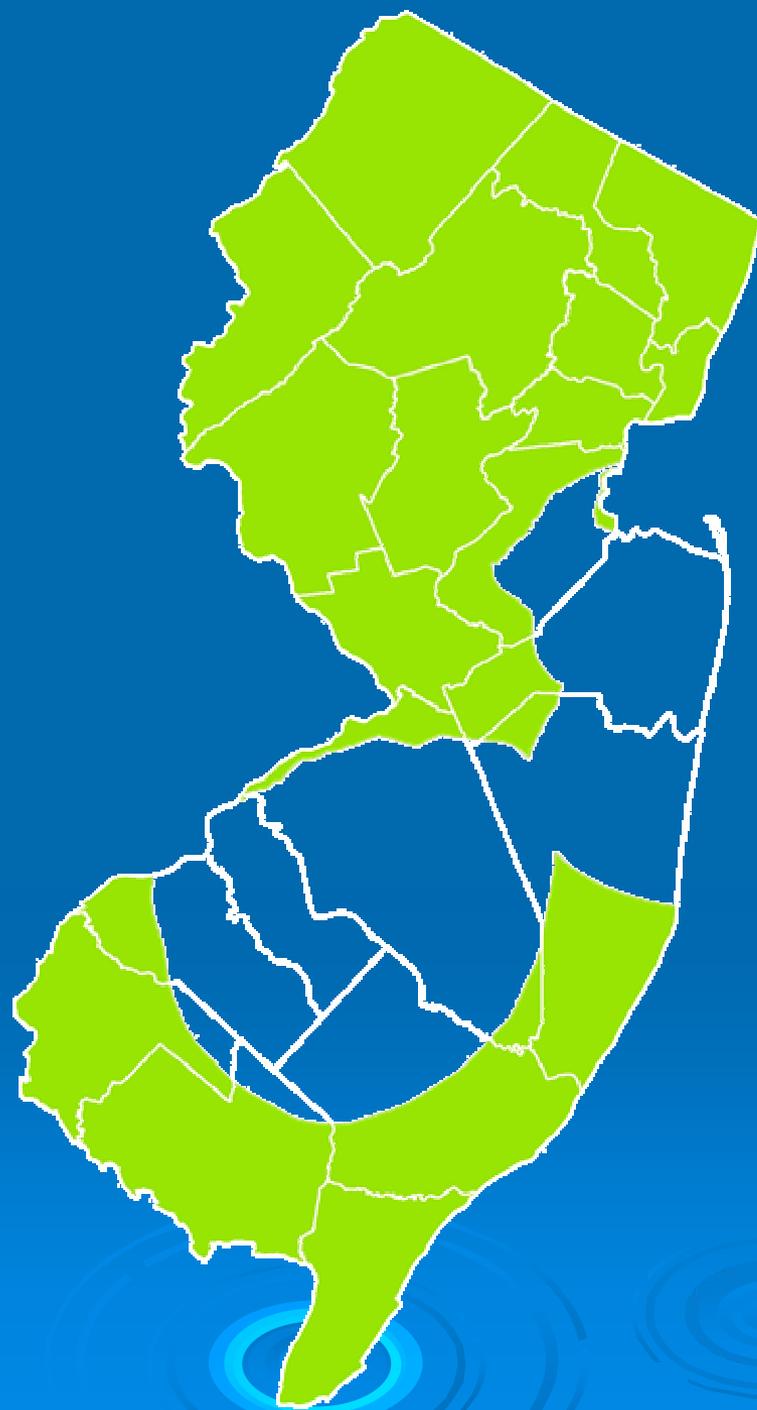


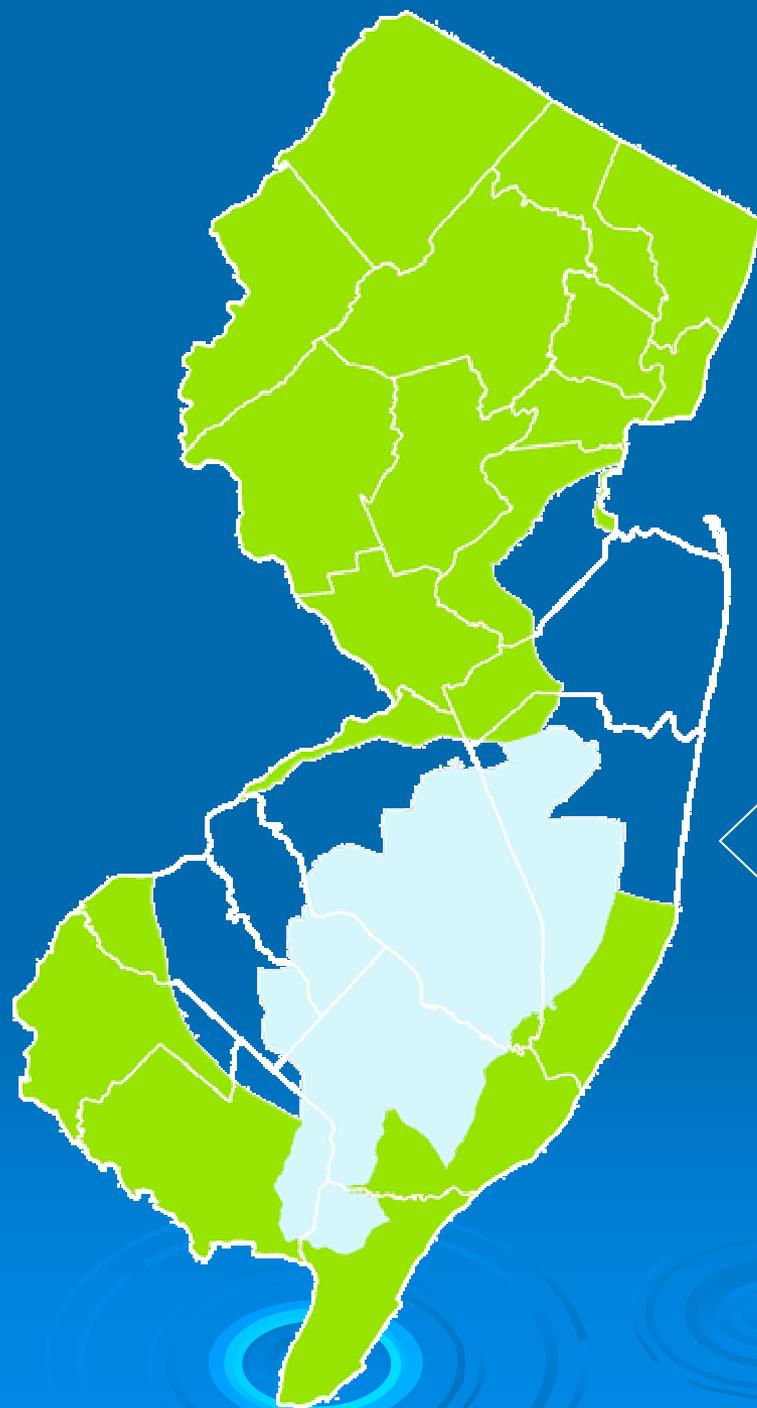
Critical Area 1

Critical Area 2



Critical Area 1

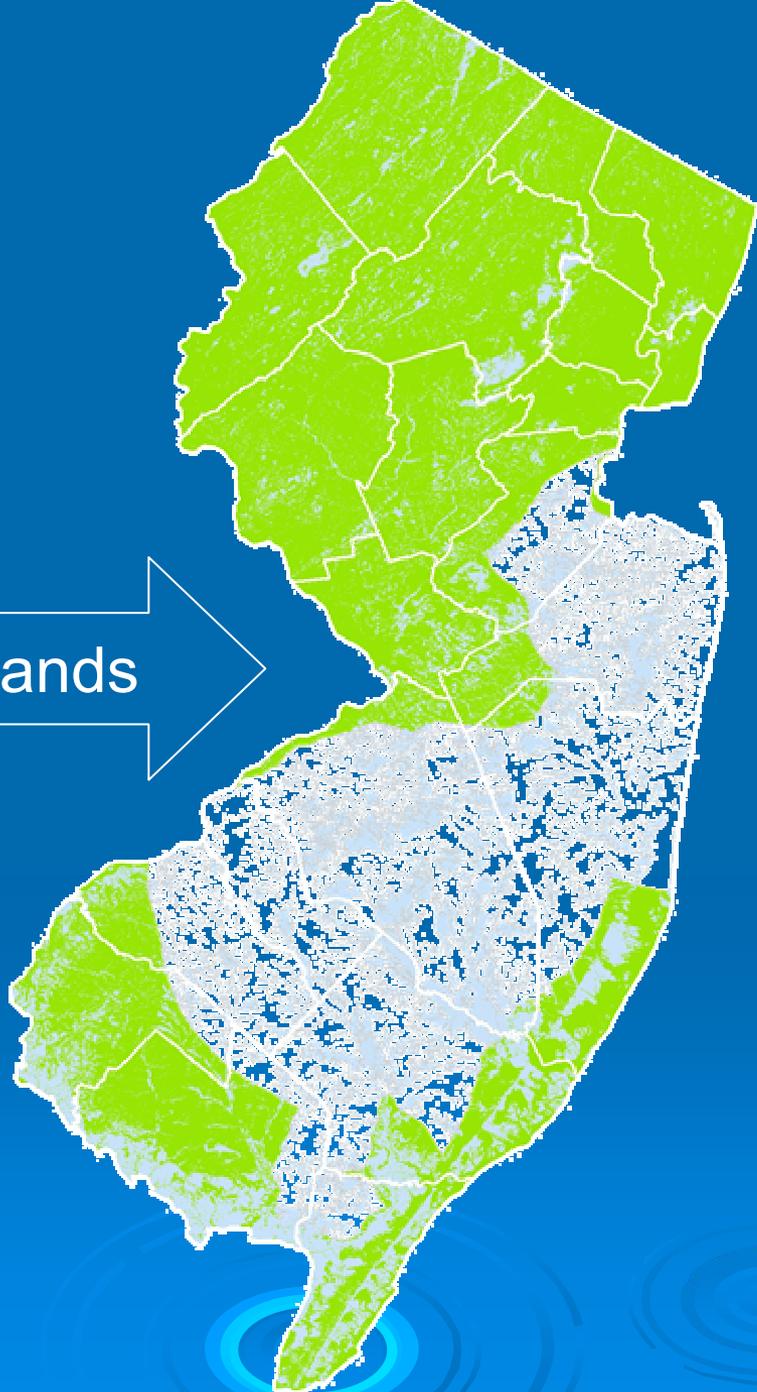




← Pinelands



Wetlands



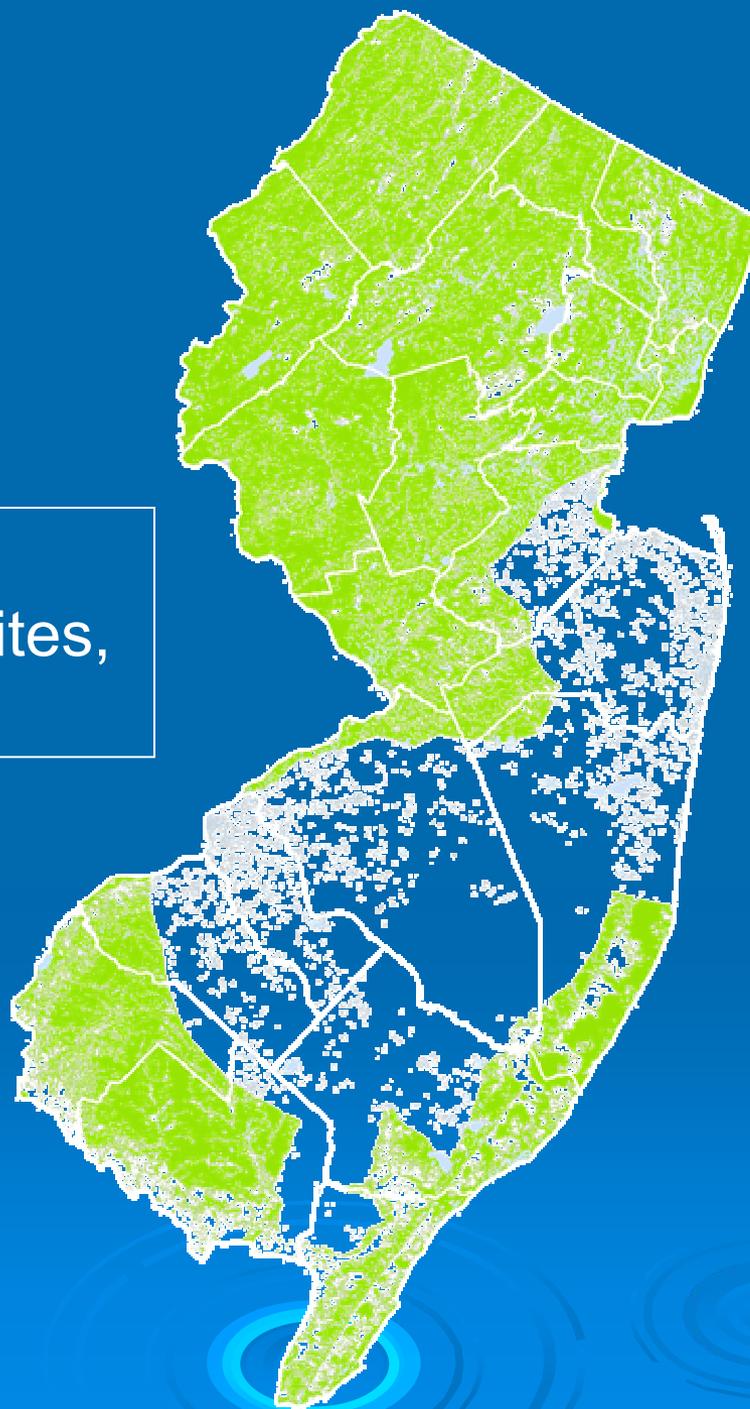


# Community & Non-Community Supply Wells

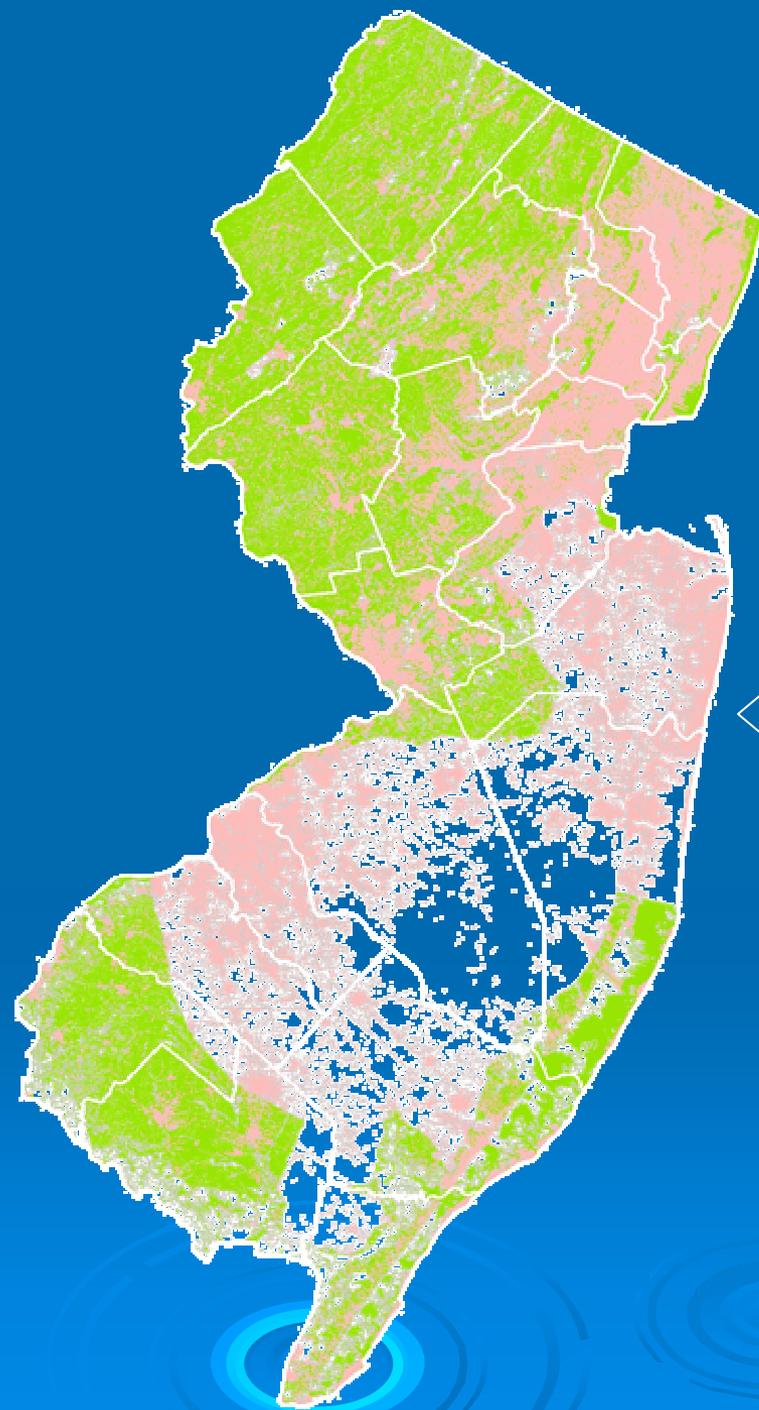




Known  
Contaminated Sites,  
CEAs & CKEs







1995 Urban LU

# Closing

- The WATER ALLOCATION permit decision process has become more and more complicated to ensure that:
  - existing and future demands are met AND
  - water resources and water dependent species are protected.
- We need scientifically defensible thresholds to support the decisions.
  - Water Budgets
  - Limits of saltwater intrusion
  - Limits to drawdowns
  - Ecological Flow goals

# Closing

- Promote more efficient use of the resource:
  - Increased conjunctive use
  - Reclaimed Water for Beneficial Reuse
  - Aquifer Storage and Recovery
  - “High Flow Skimming”
  - Interconnections
  - Advanced Technologies
- Define the criteria to be used for distributing the available supply, e.g. Smart Growth, Preserved Farmland, etc.



## **Division of Water Supply**

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