

The New Jersey Water Tracking Model

Identifying Trends, Quantifying Availability, and Managing the Resource

presented by

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Overview of the New Jersey Water Tracking Model

- New Jersey Water Transfer Data Model or NJWaTr
 - Microsoft Access database
- The tracking model is New Jersey's tool for storing and analyzing QA/QC'd water data
- Consolidates data from multiple regulatory programs and databases
- Includes geologic, hydrologic, owner, use, permit, location and volume data



Overview of the New Jersey Water Tracking Model con't

- Readily allows data additions and links to GIS
- Conveyance based model that links together withdrawals, uses and discharges with one-way conveyances
- Utilizes a template loading structure
- Developed in 2002 with NJ USGS
- Major updates in 2004, 2009 and 2010 to model and data
- Simplified DataWarehouse and DataMart mdbs available



NJWaTr Now Contains

- 1990 through 2007 monthly data
- 1.2 million monthly withdrawals from 15,000 wells and intakes
 - NJ's Water Allocation permitting program
 - domestic well estimates by municipality
- 675 water purveyors
 - 20,000 monthly bulk transfer between purveyors
- 70,000 monthly discharges
 - Sanitary sewer surface water and groundwater discharges (>20k gpd)
- Estimates of consumptive (evaporative) and depletive (export) losses



Conveyance Networks

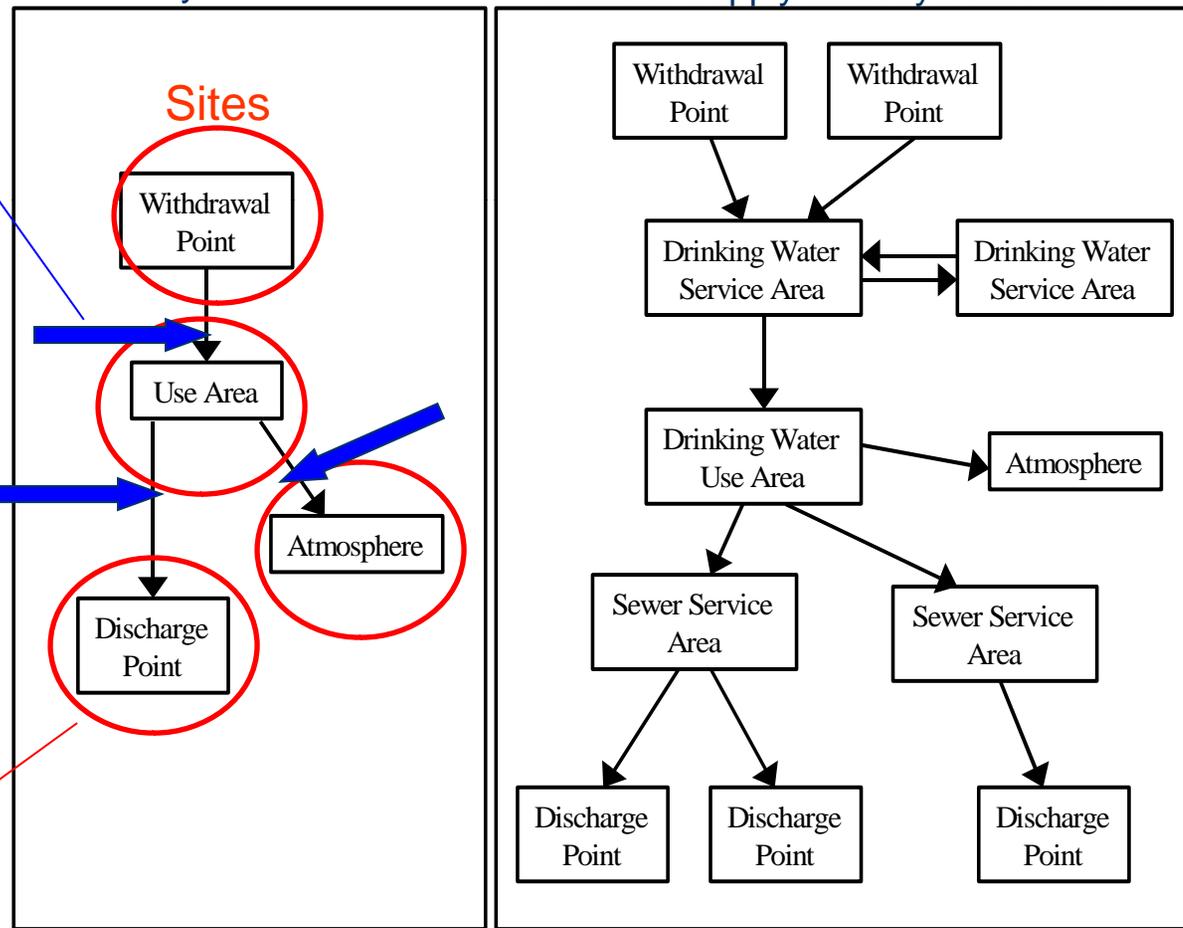
Non-Potable Supply Conveyance Network

Potable Supply Conveyance Network

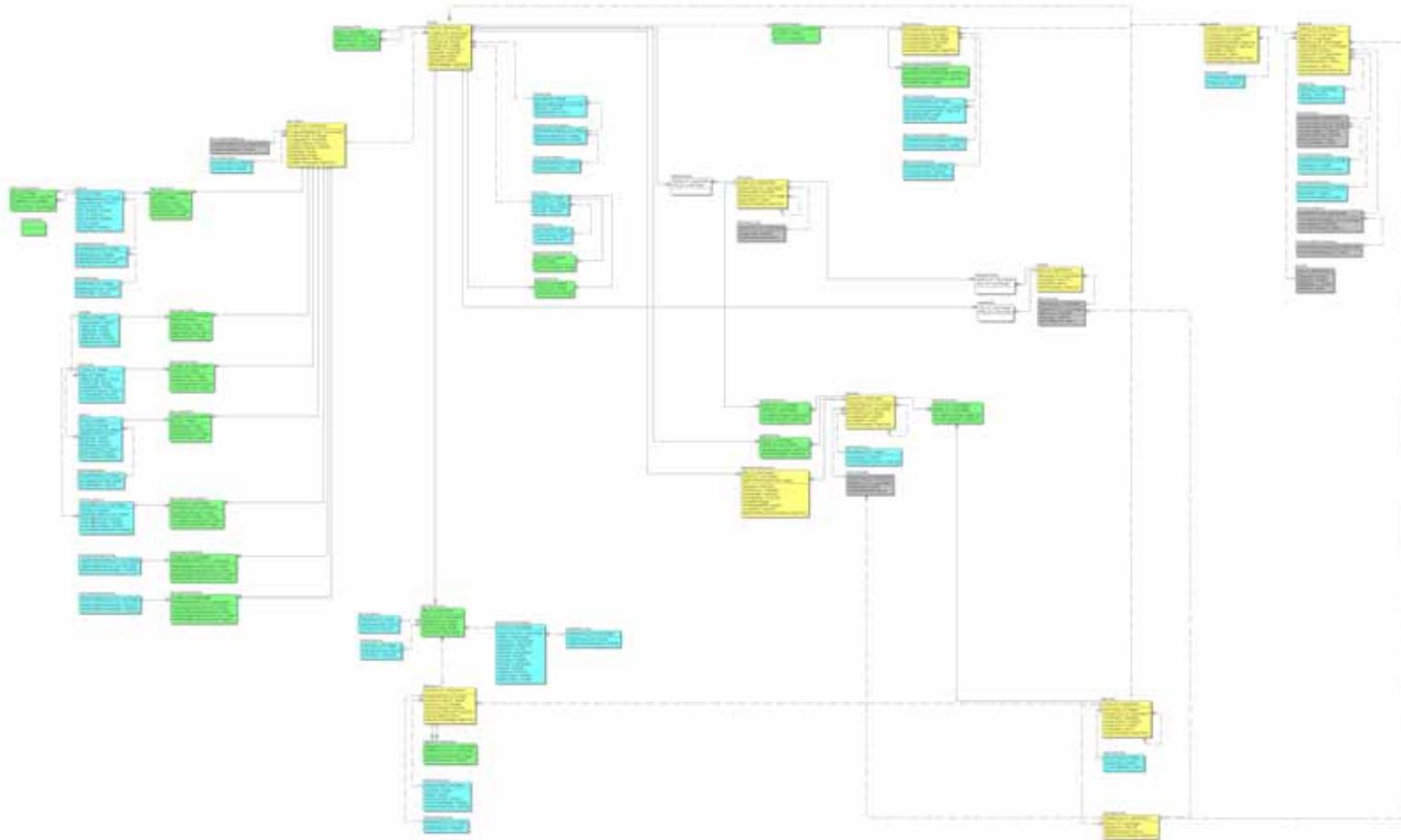
Each conveyance has from and to site, volume, and time attribute data.

One-way conveyances

Each site has owner, location, permit, use, etc attribute data.



NJWaTr Design



NJWaTr data used

- in water supply planning
- in water allocation permitting
- in ground-water models
- in watershed and surface water models
- by government agencies, universities, and private consultants

Examples

- Use and trend patterns
- System or site specific analyses
- Water tracking
- Water budgets and availability

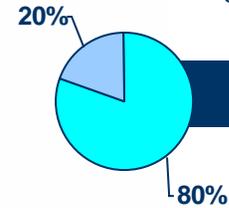


Average Source of Water by Water Region

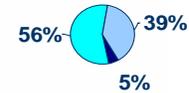
Water Region 4
Total Use = 70 bgy



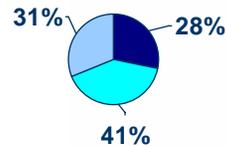
Water Region 1
Total Use = 190 bgy



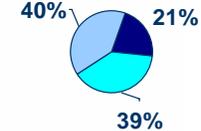
Water Region 2
Total Use = 88 bgy



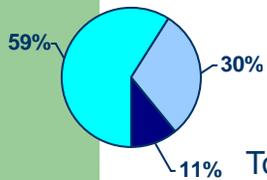
Water Region 5
Total Use = 123 bgy



Water Region 3
Total Use = 111 bgy



Statewide Average 1990-2007



Total Use = 582 bgy

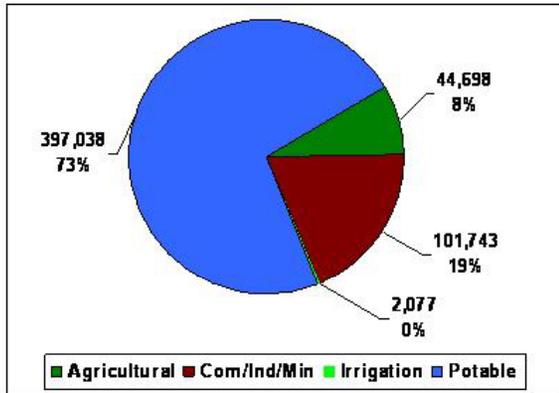
■ Confined ■ Surface water ■ Unconfined

Excludes hydropower surface water withdrawals; WRs 1, 4 and 5 have hydropower sources

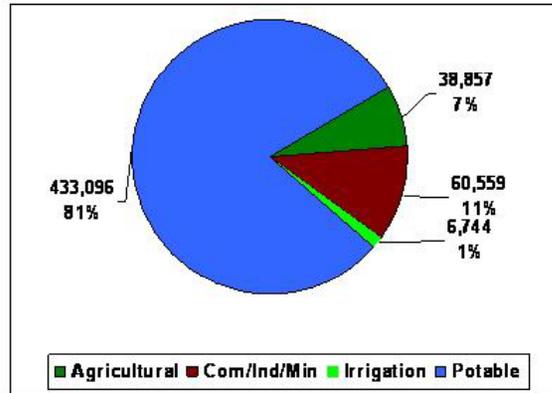
1990 versus 2007 use data

Total Use

1990 Data



2007 Data

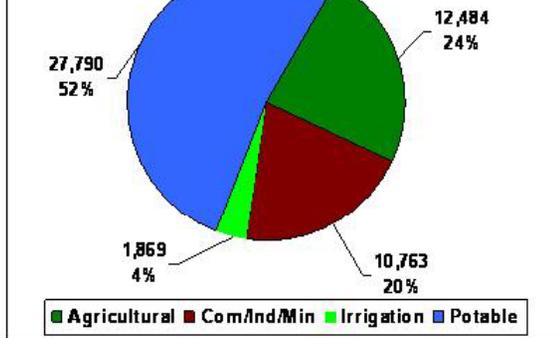


Total Use Highlights:

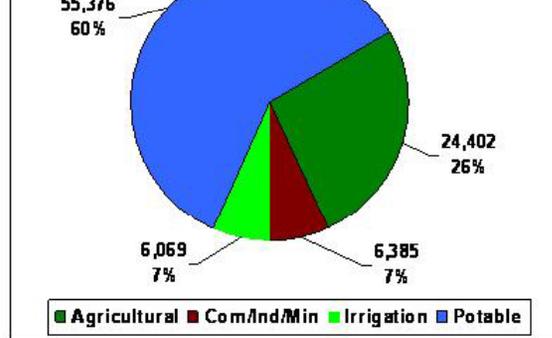
- ✓ Total use approx same
- ✓ Potable use increased
- ✓ Ind/Com/Min use decreased

Consumptive Use

1990 Data



2007 Data

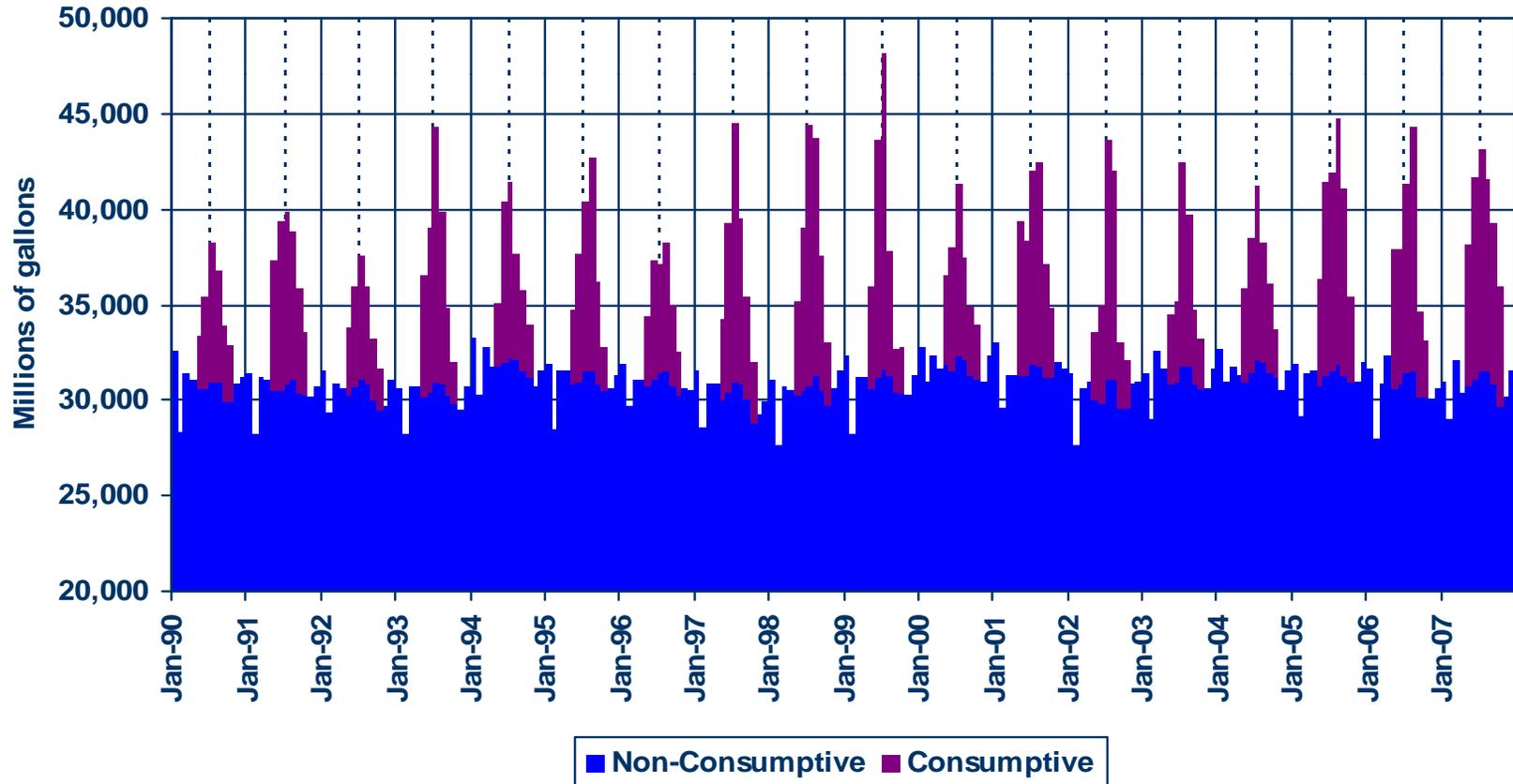


Consumptive Use Highlights:

- ✓ Consumptive use increased 75%
- ✓ Potable and Ag increased
- ✓ Ind/Com/Min decreased

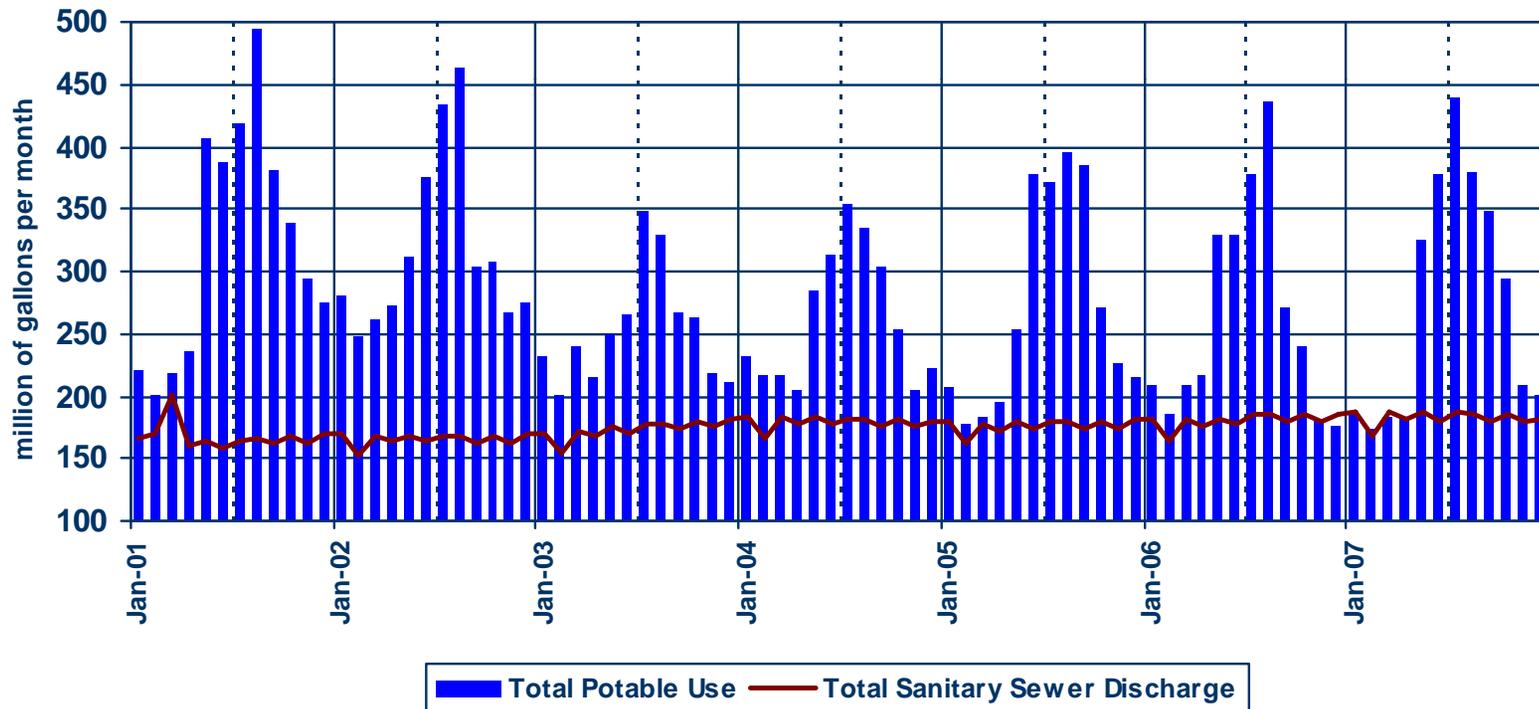


Statewide Monthly Potable Consumptive and Non-Consumptive Use



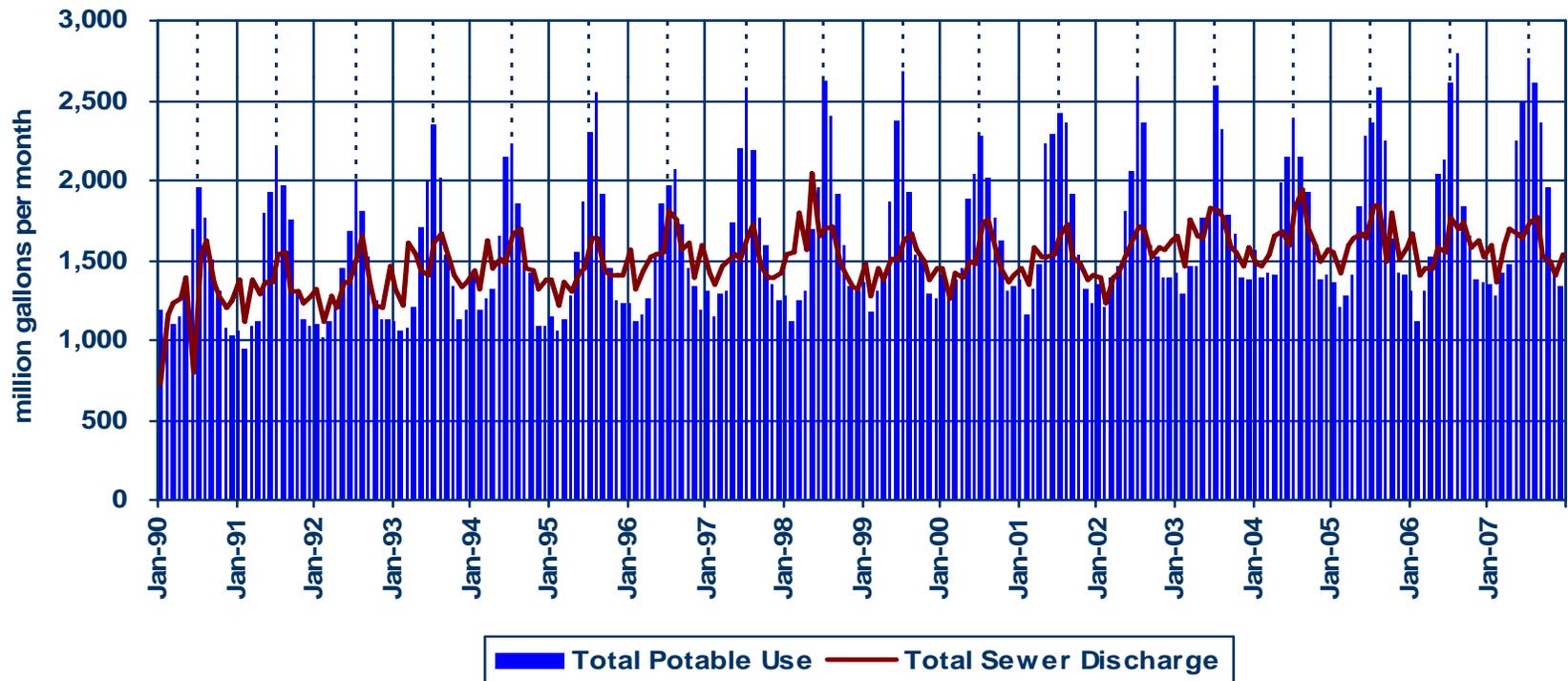
Potable Use vs Sewer Discharge

Vineland NJ

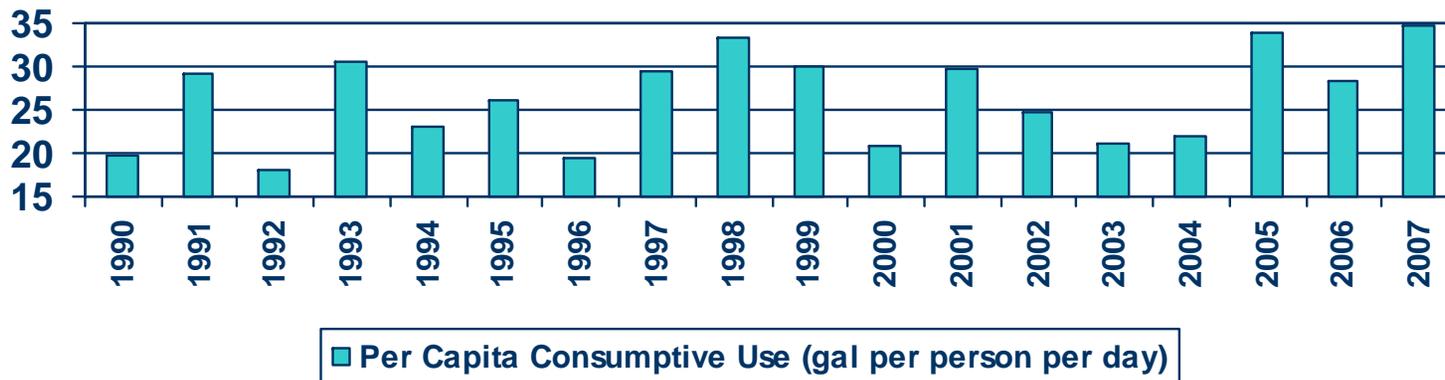
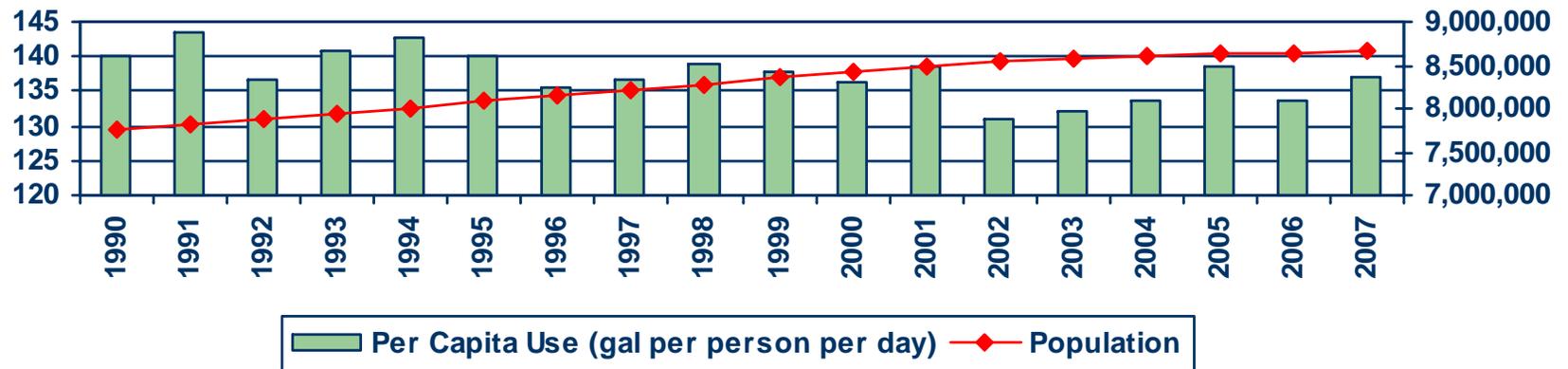


Potable Use vs Sewer Discharge

Ocean County NJ

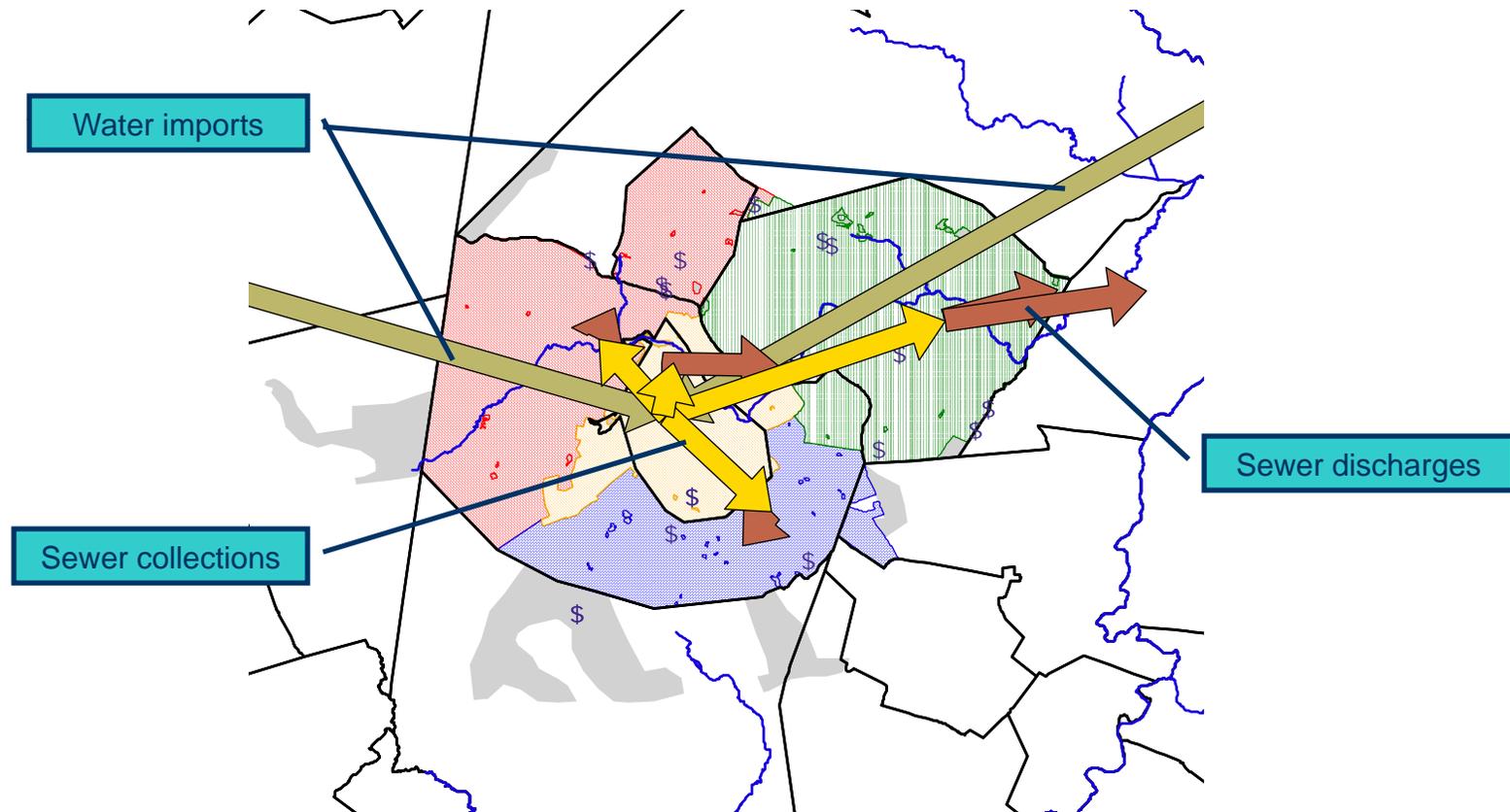


Per Capita* Water Use

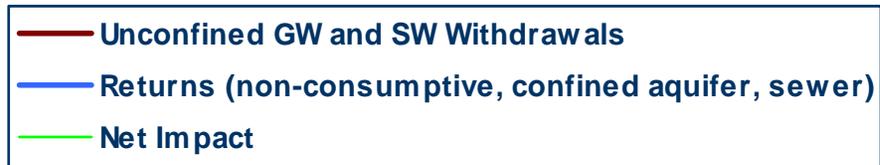
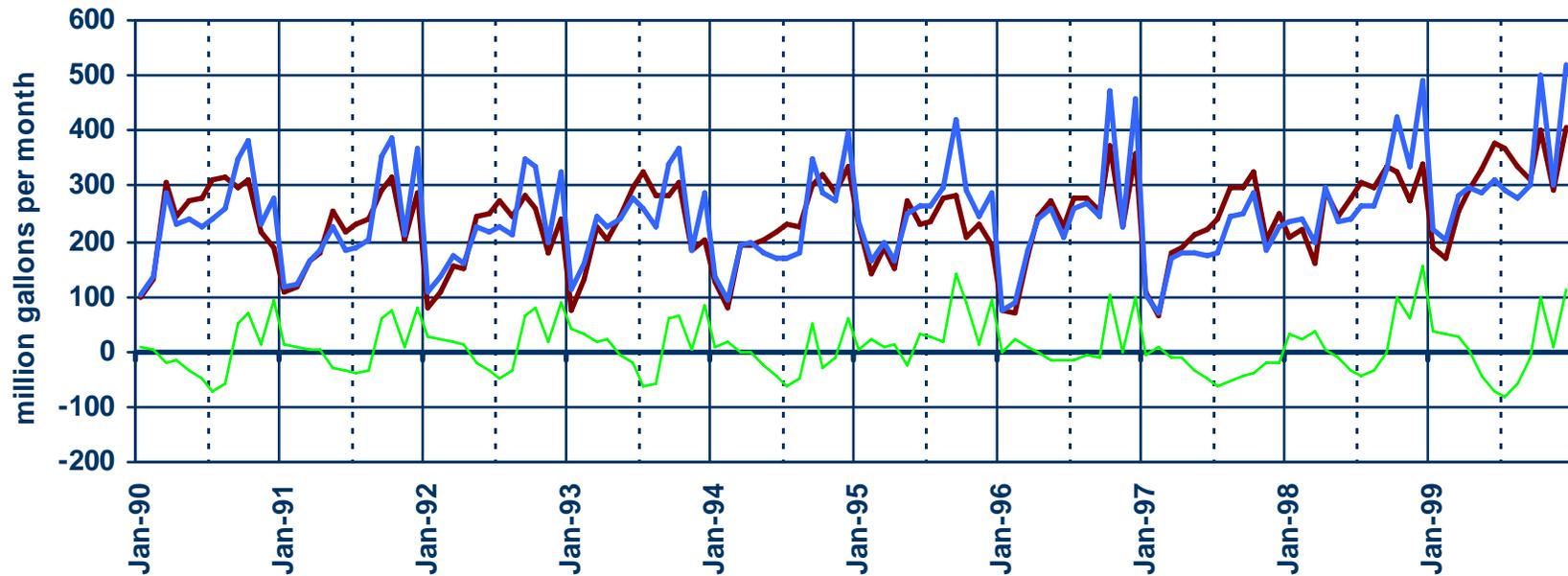


* Per capita calculation includes domestic wells and purveyor supplied residential, industrial, and commercial water

Water Tracking

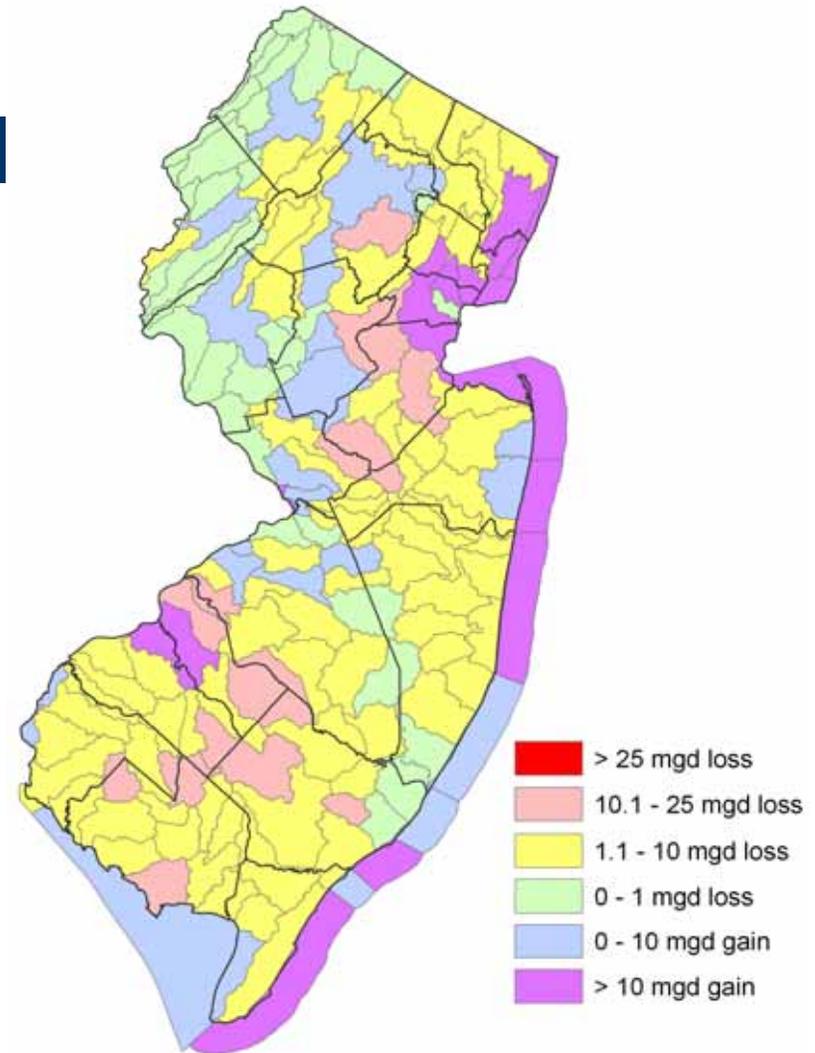


Water Balance for the North Branch Rancocas River water-table aquifer system



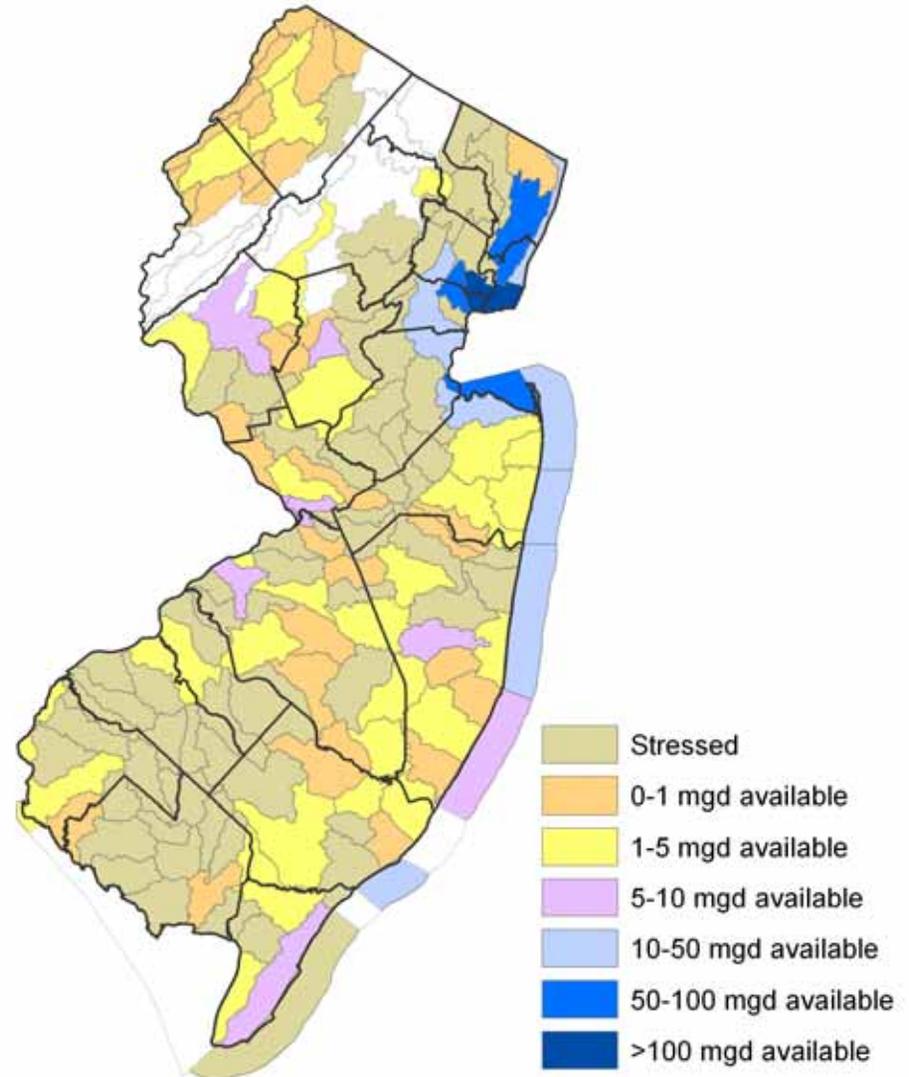
HUC11 Peak Depletive and Consumptive Loss

- Utilized in NJ's Water Supply Master Plan (draft)
- HUC11 water budget for the water-table aquifer system to estimate peak summer water loss for the 1990 to 2007 period
- Compared to sustainable availability to estimate current remaining availability



Water-table aquifer system availability

- Used in NJ's Water Supply Master Plan (draft)
- Used NJ's stream low flow margin method
 - HUC11 flow stats
 - Ecologic flow goals pilot studies



Questions?



Additional Resources

- NJWaTr USGS Report OFR 03-197
 - <http://pubs.er.usgs.gov/usgspubs/ofr/ofr03197>
- HUC11 Maps and Water Use
 - www.nj.gov/dep/njgs/enviroed/HUC11
- Watershed Management Area Water Use
 - www.nj.gov/dep/njgs/geodata/dgs04-9
- NJ Highlands Potable Water
 - <http://www.nj.gov/dep/njgs/enviroed/freedwn/highpotwater.pdf>



Thank you.

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